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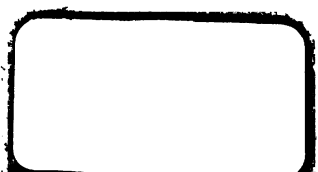
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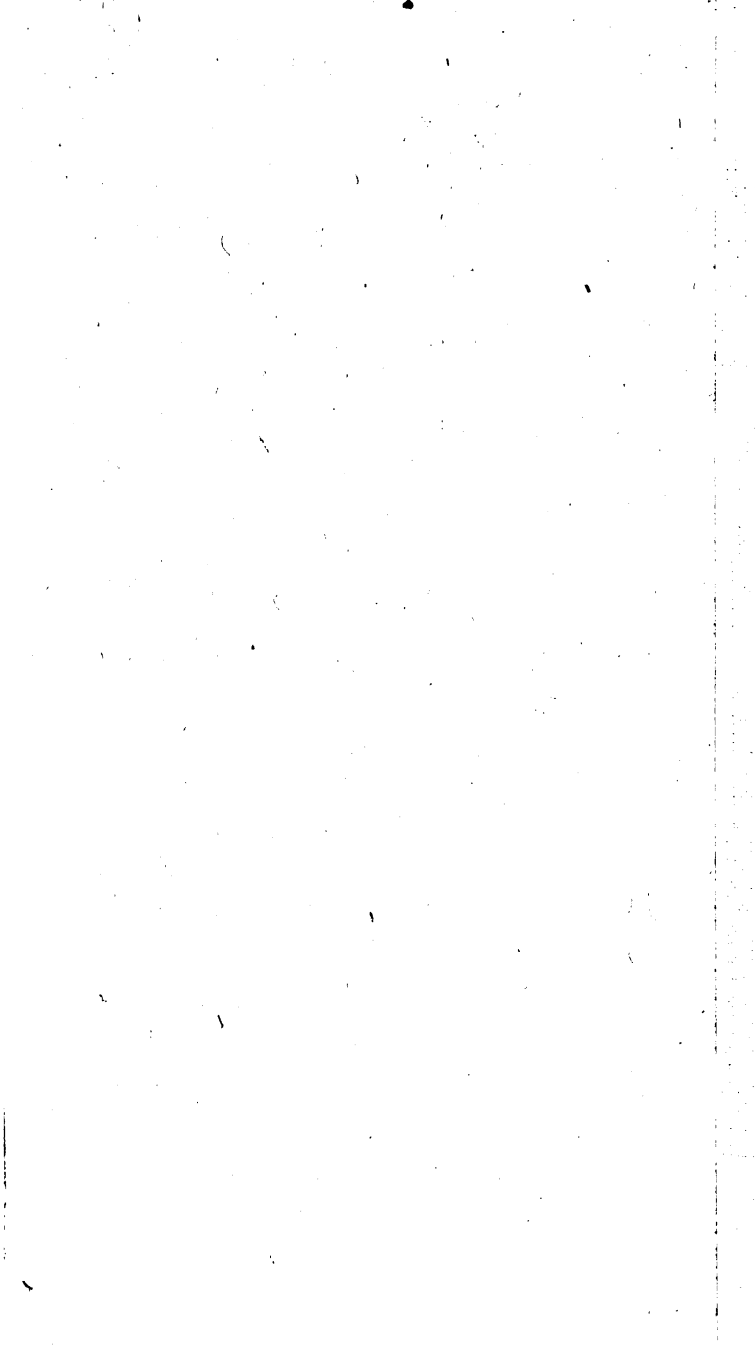
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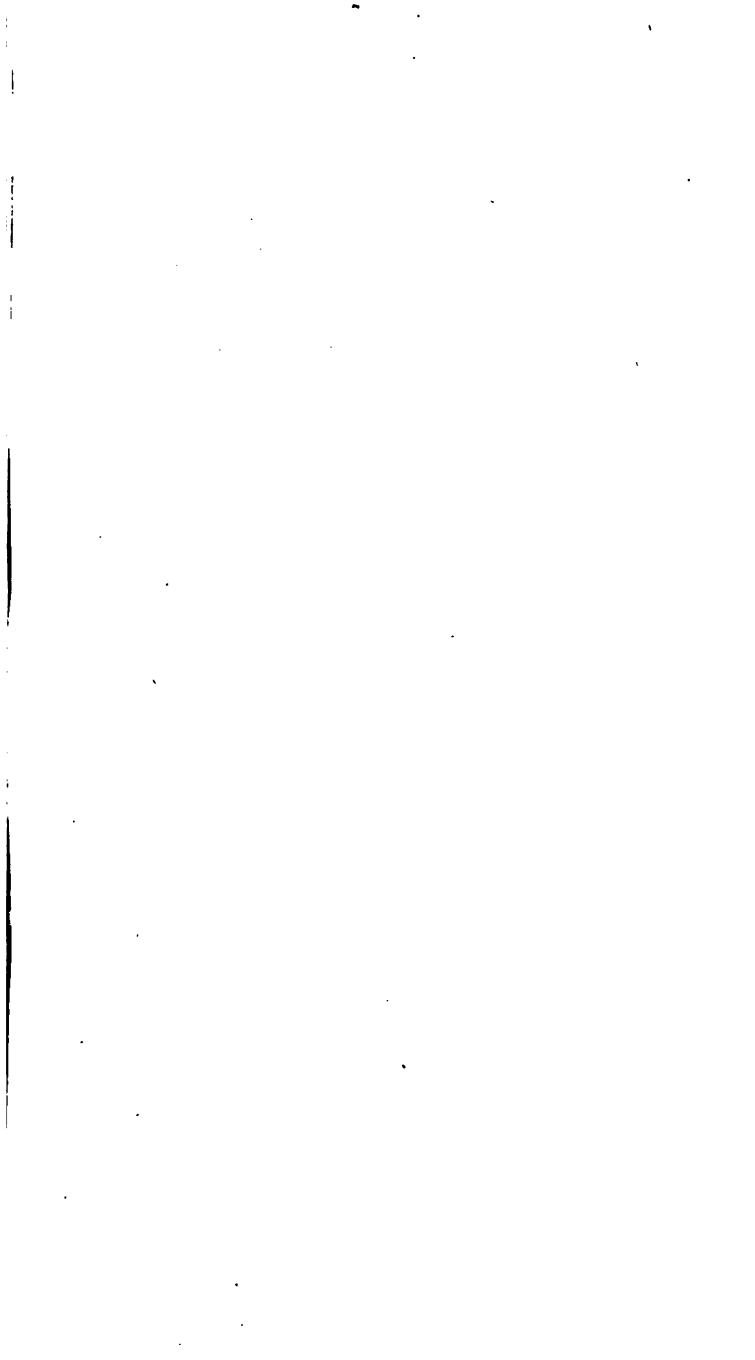


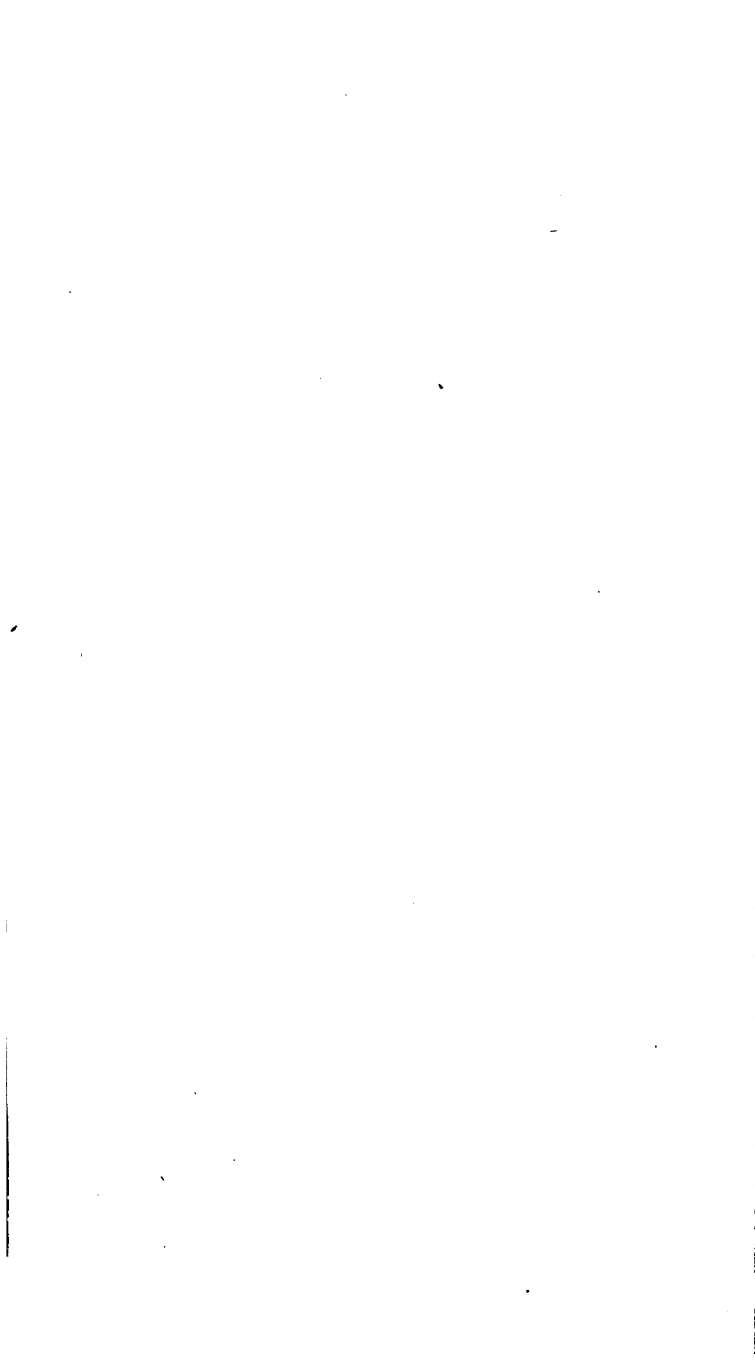
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**ASTOR. LENOX AND
TILDEN FOUNDATIONS**



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London. Published November 29th 1816 by Messrs. Sherwood, Neely & Jones.

Time's Telescope

FOR

1817;

OR,

A Complete Guide to the Almanack:

CONTAINING AN EXPLANATION

OF

SAINTS' DAYS AND HOLIDAYS;

WITH ILLUSTRATIONS OF BRITISH HISTORY AND ANTIQUITIES,

NOTICES OF OBSOLETE RITES AND CUSTOMS,

AND SKETCHES OF

COMPARATIVE CHRONOLOGY.

Astronomical Occurrences

IN EVERY MONTH;

COMPRISING REMARKS ON THE PHENOMENA OF THE CELESTIAL BODIES:

AND

THE NATURALIST'S DIARY,

EXPLAINING THE VARIOUS

APPEARANCES IN THE ANIMAL AND VEGETABLE KINGDOMS.

TO WHICH IS PREFIXED

An Introduction,

CONTAINING THE

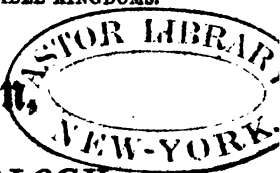
PRINCIPLES OF ZOOLOGY.

Published Annually.

London:

PRINTED FOR SHERWOOD, NEELY, AND JONES,
20, Paternoster Row.

1817.



Entered at Stationers' Hall.

James Compton, Printer, Middle Street,
Cloth Fair, London.

Advertisement.

TIME, ever on the wing, now invites his readers to an examination of his fourth Annual 'TELESCOPE,' and begs to assure them that his eye does not wax dim, or his arm grow weary with holding the instrument; the very favourable reception of his labours having stimulated inquiry, and encouraged researches—the fruits of which constitute no small part of the attractions of the present volume.

Among these novelties and varieties, will be found much that will facilitate the studies of the **ASTRONOMICAL STUDENT**—a mass of curious particulars on subjects of **NATURAL HISTORY**—numerous interesting **Sketches of COMPARATIVE CHRONOLOGY**—and a popular Introduction to the **PRINCIPLES OF ZOOLOGY**.

The poetical citations, decorative and illustrative, which are scattered with a lavish hand throughout this year's Telescope, are, with a few trifling exceptions, entirely new, and compose some of the choicest gems in *English Poesy*, both antient and modern.

The present and three former volumes are now rendered still more accessible and useful by an **INDEX**, which has been added, principally, at the request of some valuable Correspondents; to whom the Editor returns his best thanks for this and other useful hints and communications.

LONDON,
November 18, 1816.

Notices of *Time's Telescope* for 1814.

'We cheerfully give to "*Time's Telescope*" our warmest recommendation as a pleasing and *safe* book for the rising generation.'—*Eclectic Review* for February 1814.

'This Work contains a great variety of very useful information, conveyed in a most pleasing manner. We cannot hesitate to pronounce that it will be popular: it deserves to be so; and it has too many attractions, for every kind of taste, to be overlooked. It will form a delightful as well as instructive present for young persons at Christmas.'—*British Critic* for December 1813.

'This is a valuable compilation.'—*Supplement to Gentleman's Magazine* for December 1813.

'"*Time's Telescope*" bids fair to acquire considerable popularity. In truth, it deserves to be popular, for the author has shown an equal degree of acquaintance with the general principles of the subject he has undertaken to elucidate, and of taste and judgment in his illustrative and decorative extracts from various descriptive poets and other writers.'—*New Annual Register* for 1813.

'This Work conveys a very considerable portion of intelligence, that may be new to many and useful to all; and it is recommended no less by the neatness of its typographical execution, than the accuracy of its literary and scientific details.'—*Universal Magazine* for January 1814.

'On a general survey of this book, we do not hesitate to pronounce it as one of the most proper to be placed in the hands of young people. It is a little mine of information; and the mind that can rise from its perusal without having gained some important and useful knowledge, must be strongly encased in the leaden armour of stupidity.'—*Commercial Magazine* for February 1814.

Notices of *Time's Telescope* for 1815.

' We never met with a compilation better calculated for the use of families, and to serve as a portable companion for young persons, than this elegant little volume, which abounds with valuable information on subjects of general interest, and with a pleasing variety of rational entertainment. The book is written in a popular style, the articles are selected with great judgment from the best authorities; and while the scientific illustrations tend to quicken curiosity, the reflections interspersed with the extracts, occasionally given from the most charming of our poets, will increase the delight afforded by contemplating the works of nature, and raise the mind to a devout admiration of the Divine Author.'—*New Monthly Magazine*, Jan. 1815.

' The Work before us supplies accurate, though popular, instruction on a variety of topics. It is written in a correct and tasteful style, enlivened by many exquisite quotations from the poets of the day; and is interspersed with such reflections as flow naturally from the conviction that knowledge, to be extensively beneficial, either to its possessor or to others, must be purified by religion, manifested in benevolence, and consecrated to God.'—*Eclectic Review* for February, 1815.

' The History of Astronomy, and the first principles of the art, are well displayed in this entertaining volume. It will be the source of much amusement and information upon the mysteries of the Almanack, and the appearances of the heavenly bodies. Much curious matter respecting the several Saints' Days has been collected together; which, with an accurate account of the flowers which blossom and the buds which appear in the course of every month, cannot fail to interest and instruct the reader.'—*British Critic* for December 1814.

' We have no hesitation in giving "*Time's Telescope*" our unqualified commendation.'—*Gentleman's Magazine* for February 1815.

' This is the second annual appearance of "*Time's Telescope*," and we willingly confess that it is much improved. The quantity of useful and interesting matter which is here amassed together, distributed with judicious appropriation under each month, is highly creditable to the industry and taste of the compiler.'—*New Universal Magazine* for December 1814.

What anger, envy, &c., can torment his breast, whom not only the greatest and noblest objects, but every sand, every pebble, every grass, every fly, can divert? To whom the returns of every season, every month, every day, do suggest a circle of most pleasing reflections.—SPRAT.

—
God is seen in all, and all in God :
I read his awful name, emblazoned high
With *golden letters* on th' illumined *sky* ;
Nor less the mystic characters I see
Wrought on each *flow'r*, inscribed on ev'ry *tree* ;
In ev'ry *leaf* that trembles on the breeze
I hear the voice of God among the *trees* ;—
In ev'ry *creature* own his forming power.

BARBAULD.

—
The meanest *insect* we can see, and the most contemptible *weed* we can tread upon, is really sufficient to confound atheism, and baffle all its pretensions. How much more that astonishing variety of God's Works, with which we are continually surrounded !—BALGUY.

Introduction.

PRINCIPLES OF ZOOLOGY.

Of the innumerable eyes that open upon Nature, none but those of MAN see its AUTHOR and its end. ALISON.

WHILE we contemplate the infinitely varied forms in the field of nature, and trace their gradations or connexions, we possess the peculiar advantage of uniting amusement with instruction, and our minds are impressed with a train of the most pleasing ideas. It is no unimportant object, to be able to secure to ourselves some species of study, which, in its progress, may continue to afford a rational delight, and in the pursuit of which there can be no fear of soon exhausting the subject. The celebrated RAY, speaking of the study of natural history, says, 'No knowledge can be more pleasant to the soul than this; none so satisfying, or that doth so feed the mind; in comparison of which, the study of words and phrases seemeth insipid and jejune; for words being but the images of things, to be given up wholly to their study, what is it but to verify the folly of *Pygmalion*, to fall in love with a statue, and neglect the reality? The treasures of nature are inexhaustible: there is enough for the most indefatigable industry, the happiest opportunities, the most prolix and undisturbed vacancies.'

ZOOLOGY is the doctrine or description of the 'animal kingdom,' as *Botany*, or phytology, is that of the vegetable, and *Mineralogy* that of the mineral or fossil kingdom. NATURAL HISTORY, properly speaking, embraces the whole of these departments

of knowledge, though occasionally, but improperly, restricted to the first.

As the inferior animals upon our globe are so numerous, it would be impossible for mankind to distinguish them from one another, or to gain any considerable knowledge of their relative natures and habits, if they did not exhibit remarkable differences which render it easy to establish distinctions among them. Hence zoologists have always been attentive to these differences, and, by dividing animals accordingly, either into more or fewer classes, have conveniently formed what are called *methods*. It is certain, indeed, that no such classifications exist in nature, where all the various individuals constitute one continued and uninterrupted chain; yet they considerably assist the memory, and may be rendered truly useful guides in the study of animated being.

Several scientific and ingenious classifications or arrangements of the animal kingdom into classes, orders, genera, and species, have been successively adopted; among which, that of M. CUVIER, the celebrated French anatomist, must be allowed to possess a very high degree of merit. Though the arrangement of M. Cuvier evinces great anatomical precision, and the highest philosophical knowledge of animals, yet, upon the whole, it has a complicated and forbidding appearance to a general reader, and is, of course, less immediately attractive than the more simple arrangement of LINNÆUS,* which divides the animal kingdom into six classes;—*mammalia*, *aves*, *amphibia*, *pisces*, *insecta*, *vermes*, or such as suckle their young; birds; creatures living equally on land or in water; fishes; insects; and worms. Each of these classes is subdivided into orders, genera, species, and varieties of those species. But, as we have already treated the subject of '*Botany**, we shall se-

* See the '*Elements of Botany*,' in the Introduction to T. T. for 1816.

lect the next connecting link in the great chain of Natural History, and commence with the lowest stages of animal existence.

CLASS I. Zoophytes and Worms.

Gradual, from these what numerous kinds descend,
Evading e'en the *microscopic* eye !
Full Nature swarms with life ; one wondrous mass
Of animals, or atoms organized,
Waiting the vital breath, when Parent Heav'n
Shall bid his spirit blow. THOMSON.

THE class *vermes* is divided by Linnæus into *mollusca*, *vermes*, *zoophyta*, and *animalcula infusoria* ; or soft-bodied animals, plant-animals, worms, and animalcules of infusions. Nearly all the animals of the class *vermes* have but slow locomotive powers. Many of them have arterial and venous vessels, in which the blood undergoes a real circulation ; but these are by no means common to the whole class. In some of them eyes and ears are very perceptible, while others seem to enjoy only the senses of taste and touch, which are never wanting. Many have no distinct head, and most of them are without feet. The whole of these creatures are very tenacious of life. In most of them, parts that have been destroyed will afterwards be reproduced.

I. ZOOPHYTA, zoophytes, or plant-animals, seem to hold a middle station between vegetables and animals. Most of them, deprived of locomotion, are fixed by stems that take root in the crevices of rocks, among sand, or in other situations. The genus *hydra* or polype first deserves our notice. These curious animals are found adhering to the stems of aquatic plants, or to the under-surfaces of the leaves. The species are multiplied by vegetation, one or two or even more young ones emerging gradually from the sides of the parent animal ; and these young are frequently again prolific, so that it is not uncommon

to see two or three generations at once in the same polype. But the most curious particular respecting this animal is, its *multiplication by dissection*. It may be cut in every direction, and even into very minute divisions, and not only the parent stock will remain uninjured, but *every section will become a perfect animal*. Even when turned inside out, it suffers no material injury ; for in this state it will soon begin to take food, and to perform all its other animal functions.

Coupés vingt fois, vingt fois ils vont se ranimer,
Et du front mutilé, toujours prompts à renâître
Au bout de leur long tube on les voit reparaître.

Sous les ciseaux féconds prompte à fructifier,
Chaque part du reptile est un reptile entier.
Par un pouvoir secret qu'aucun pouvoir n'arrête,
Il aiguise sa queue, il arrondit sa tête :
Ainsi l'arbre taillé repousse en rejeton,
Tel un germe caché vit dans chaque bouton.

DE LILLE.

The hard or horny zoophytes are known by the name of *corals*, and are equally of an animal nature with the polype ; the whole coral continuing to grow as an *animal*, and to form by secretion the strong or stony part of the coral, which at once may be considered as its bone and its habitation, and which it has no power of leaving*. Some of the coral tribe have their animal part approaching more to that of a medusa, than of a polype. Of this kind are those numerous corals known by the name of *madrepores*. The smaller corals are termed *corallines*, or sea-mosses ; and are actually so many ramified sea-polypes, covered with a horny case, to defend them from the injuries which they would otherwise be liable to, in the boisterous elements in which they

* Our hills are in many places full of them, and some rocks are entirely of their formation. Many seas are becoming every year more difficult to navigate, being nearly choked up by the habitations of animals almost too small for human perception,

are destined to reside. The principal genera of the *corallines* are: 1. *Sertularia*. 2. *Tubularia*. 3. *Flustra*. Those of the *corals* are, 1. *Gorgonia*, Venus's fan. 2. *Isis*. 3. *Madrepora*. 4. *Millepora*. 5. *Tubipora*.

II. **ANIMALCULA INFUSORIA**, or animalcules found in different liquids. These minute beings are principally to be observed, by the aid of the microscope, in such fluids as have had any animal or vegetable substance infused in them. The ancients were totally unacquainted with this class of beings. To them, the *mite* was made the *ne plus ultra*, or utmost bound of animal minuteness; but the moderns, assisted by that powerful instrument, the *microscope*, have discovered whole tribes of animals, compared with which even *mites* may be considered as a kind of **ELEPHANTS**!

The *microscope* has opened the eye of man upon a world of innumerable animalcules, which people the three inhabitable elements of Nature. Myriads of them dance with the motes in the sunbeams, they swim by millions in a dew-drop, brew and prepare the glebe for vegetation, and ebb and flow with the air of our breath.

These concealed

By the kind art of forming Heaven, escape
The grosser eye of man; for if the worlds,
In worlds inclosed, should on his senses burst,
From cates ambrosial and the nectared bowl
He would, abhorrent, turn; and in dead night,
When silence sleeps o'er all, be stunned with noise.

THOMSON.

The principal genera of the *Animalcula Infusoria* are, 1. *Vorticella*. The *v. convallaria* is a beautiful transparent animalcule, formed like a bell-shaped flower, and furnished with a long tail or stem, by which it generally affixes itself to the stems and under-surface of the common *lemna minor*, or duckweed. The *v. racemosa* is still more elegant. It is found in clear stagnant waters during the summer months, attached to the stalks of the smaller water-

plants. If submitted to the examination of the microscope, several small ramifications will be perceived to issue from a single stem, each terminated by an apparent flower, like that of a *convolvulus*. The whole is in the highest degree transparent, and the alternate expansion and contraction of the seeming flowers forms a very curious and interesting spectacle. The *v. rotatoria*, or wheel-animal, so named from the apparent rapid motion of the head, is remarkable for its strange power of restoration to life and motion, after being dried many months in a glass. 5. *Cercaria*: The *c. mutabilis*, or changeable cercaria, is the cause of that fine *deep-green scum* which appears on the surface of stagnant waters during the summer months.

Where the pool
 Stands mantled o'er with green, invisible,
 Amid the floating verdure, millions stray.
 Each liquid too, whether it pierces, soothes,
 Inflames, refreshes, or exalts the taste,
 With various forms abounds. Nor is the stream
 Of purest crystal, nor the lucid air,
 Though one transparent vacancy it seems,
 Void of their unseen people.

THOMSON.

3. *Trichoda*. The *t. sol* is a globe or ball, beset on all sides with very long diverging rays, having the appearance of a sun. It is about the size of a small pin's head, and is generally affixed to the stem of some small water-plant. This animalcule may be pulled or torn in pieces, by means of a pair of needles, or other convenient instruments, and, in the space of a single hour, each piece will be apparently complete, and perfectly globular like the original.—4. *Volvox*. The *v. globator* often equals the size of a pin's head. In the advanced state of spring, and again in autumn, it appears in immense numbers in the clearer kinds of *stagnant waters*. Its motions are irregular, in all directions, and, at the same time, rolling or spinning as if on an axis.—5. The *vibrio* is the largest of all the animalcular tribe.

One species of the *v. anguillula*, or eel-vibrio, inhabits acid paste; when full-grown, it measures the tenth of an inch in length. It is viviparous, and frequently produces a tribe of young*. Its general appearance, when magnified, is that of an eel†. The other species may be sometimes found in vinegar. —6, 7. *Cyclidium* and *Monas* are exceedingly small; a species, called the *m. termo*, when surveyed by the utmost powers of the microscope, still appears but as a kind of moving point, having merely a sensible diameter.

A countless swarm of animalcules will always appear in any vegetable infusion, after the space of a few days; as in the infusion of hay, beans, wheat, and other substances. The blueish appearance on the surface of plums, grapes, and many other fruits, is not 'a living world,' but a mere vegetable efflorescence, which regularly takes place on such kind of fruit.

III. The MOLLUSCA derive their name from the soft, fleshy nature of their body. This class includes those pulpy animals, which may either be destitute of an external covering, when they are called *mollusca nuda*, as the slug; or may be inclosed in one or more shells, as the snail, oyster, &c., when they are termed *testacea*.

1. *Mollusca nuda* are those soft-bodied animals, which are destitute of any truly shelly or very hard integument; though some particular genera have a

* If one of them be cut through the middle, several young ones coiled up and inclosed, each in a membrane, will be seen to proceed from the wound. More than one hundred young have issued from a single parent.

† Mr. Baker, the celebrated microscopic observer, with an instrument of highly magnifying powers, saw these eels an inch and a half in diameter, and of a proportionate length. They swam up and down very briskly. The motion of their intestines was very visible: when the water dried up, they died in apparent agonies, and their mouths opened very wide.

coriaceous or leathery covering. Most of them are furnished with *tentacula*, or feelers. The principal genera are:—1. *Limax*, slug. 2. *Aplysia*, a marine worm. 3. *Doris*, a sea-snail. 4. *Nereis*. 5. *Terebella*. 6. *Pyrosoma*. 7. *Nais*. 8. *Sepia*, cuttle-fish. 9. *Calamary*, *Loligo*, pen-fish, or ink-fish. 10. *Medusa*, sea-blubber, sea-nettles. 11. *Holothuria*. 12. *Actinia*, sea-anemone. 13. *Asterias*, star-fish. 14. *Echinus*, sea-urchin.

The well-known Chinese preparation, called *Indian-ink*, is supposed to be no other than the black liquor found in the body of the *cuttle-fish*, carefully managed, perfumed, and formed into ornamental cakes. The eggs of this fish, of the size of small filberts, and of a black colour, are frequently seen on the sea-shore, and are popularly termed *sea-grapes*. The dark inky fluid, which this animal emits when alarmed, not only tinges the water, so as to conceal its retreat, but is, at the same time, so bitter, as immediately to drive off its enemies.

Th' endangered *cuttle* thus evades his fears,
And native hoards of fluid safely bears.
A pitchy ink peculiar glands supply,
Whose shades the sharpest beam of light defy.
Pursued he bids the sable fountain flow,
And, wrapt in clouds, eludes th' impending foe.
The fish retreats unseen, while self-born night,
With pious shade, befriends her parent's flight.

So tenacious are the *sea-urchins* of the vital principle, that, on opening one of them, it is no uncommon circumstance to observe the several parts of the broken shell move off in different directions. The ancients, according to Oppian, gave credence to a circumstance much more wonderful than this:—

Sea-urchins, who their native armour boast,
All stuck with spikes, prefer the sandy coast,
Should you with knives their prickly bodies wound,
Till the crude morrels pant upon the ground;
You may, ere then, when motion seems no more,
Departing sense and fleeting life restore.

If in the sea the mangled parts you cast,
The conscious pieces to their fellows haste;
Again they aptly join, their whole compose,
Move as before, nor life nor vigour lose*.

2. *Mollusca testacea*, or soft-bodied animals furnished with shells, are divided into three assortments, called univalves, bivalves, and multivalves; meaning, that the shelly cover consists either of one, two, or several parts or valves. A *univalve* shell may be exemplified by that of the common *snail*; for the shell is simple or undivided. A *bivalve* shell may be exemplified by a *muscle*, in which, as every one knows, the shell is composed of two pieces or valves; and, lastly, a *multivalve* shell may be exemplified by any species of *lepas* or *bermacle*, in which the shelly covering of the animal is formed of several pieces or divisions. The shell-animals are produced from eggs, which, in some species, are gelatinous, or gluey; and, in others, covered with a hard or calcareous shell: and the young animal emerges from the egg with its shell on its back. The most familiar and convincing proof of this may be obtained, by observing the evolution or hatching of the eggs of the common garden-snail, as well as of several of the water-snails, which deposit eggs so transparent, that the motions of the young, with the shell on its back, may be very distinctly seen several days before the period of hatching.

All the shell-animals are of such a constitution as perpetually to secrete or exude from their bodies a viscid moisture, and it is with this, managed according to the exigencies of the animal, that the shell is, throughout life, increased in dimensions, and repaired when accidentally broken in any particular part. The growth of shells proceeds from the edges of the mouth or opening, and thus the spires or turns of the *univalve* shells are gradually increased in number and size, till the animal has arrived at its

* Bingley's Animal Biography, vol. iii, pp. 435, 436.

full growth. The *bivalves* are increased in a similar manner, by the gradual enlargement of the outline of each valve. The principal genera in the **UNI-VALVES** are—1. *Argonauta*. 2. *Nautilus*, pearly-nautilus. 3. *Helix*, snail*. 4. *Dentalium*, tooth-fish. 5. *Serpula*. 6. *Teredo*, ship-worm. 7. *Sabella*. 8. *Patella*, limpet. **BIVALVES**—1. *Anomia*. 2. *Pinna*. 3. *Mytilus*, muscle and mother-of-pearl shell. 4. *Mya*, pearl shell. 5. *Spondylus*. 6. *Chama*, clamp shell. 7. *Solen*, razor shell. 8. *Ostrea*, oyster. 9. *Cardium*, cockle. **MULTIVALVES**—1. *Pholas*. 2. *Chiton*. 3. *Lepas*, bernacle shell.

Learn of the little *Nautilus* to sail,
Spread the thin oar, and catch the driving gale.

The *argonauta*, known to shell collectors by the name of the *paper-nautilus*, is supposed to have given to man the first idea of navigation. When it means to sail, it discharges a quantity of water from its shell, by which it is rendered lighter than the surrounding medium, and, of course, rises to the surface. Here it extends two of its arms upward, which are each furnished at their extremity with an oval membrane, that serves as a sail. The other six arms hang over the sides of the shell, and supply the place either of oars or rudder. It is an inhabitant of the Mediterranean and Atlantic seas.

Two feet they upward raise, and steady keep;
These are the masts and rigging of the ship.
A membrane stretched between supplies the sail,
Bends from the masts, and swells before the gale.
The other feet hang paddling on each side,
And serve for oars to row, and helm to guide.
'Tis thus they sail, pleased with the wanton game,
The fish, the sailor, and the ship the same.
But, when the swimmers dread some danger near,
The sportive pleasure yields to stronger fear:

* And then the whining school-boy with his satchel,
And shining morning face, creeping like snail
Unwilling to school.

No more they wanton drive before the blasts,
But strike the sails, and bring down all the masts.
The rolling waves their sinking shells o'erflow,
And dash them down again to sands below.

When the *limpet* is properly cleaned, the shell is sometimes found of a beautiful purple tint, and sometimes emits rays of reflected light of an uncommon brilliancy. They are found on the rocks, which are incessantly beaten by the surges and breakers on the sea shores of almost every country in the world. The rays of variegated colours which issue from their centre-tops, are sometimes found of the most vivid colours; and the animal that lives under this magnificent roof and versicolor canopy, is a kind of slug, as disagreeable to the eye for its shape, as its flesh is for its taste insipid to the palate. It is not by any glutinous liquid, as it has been asserted, that this fish adheres so strongly to the rock, but by the simple process of sucking the air between its body and the ground, to which it affixes itself.

Oysters breathe by means of gills. They draw the water in at their mouth, a small opening in the upper part of the body; drive it down a long canal that constitutes the base of the gills, and so out again, retaining the air for the necessary functions of the body.

Lonely dependent from weed-fringed rocks,
Unmoved she dares the storm's tremendous shocks.

The principal breeding time of *oysters* is in the months of April and May, when they cast their spawn, or *spats*, as the fishermen call them, upon rocks, stones, shells, or any other hard substance that happens to be near the place where they lie, to which the spats immediately adhere. These, till they obtain their film or crust, are somewhat like the drop of a candle, but are of a greenish hue. The substances to which they adhere, of whatever nature, are called *cultch*. From the spawning-time until about the end of July the *oysters* are said to be

sick, but, by the end of August, they become perfectly recovered. During these months they are out of season, and are bad eating.

The oyster fishery of our principal coasts is regulated by a court of admiralty. In the month of May, the fishermen are allowed to take the oysters, in order to separate the spawn from the cultch, the latter of which is thrown in again, for the purpose of preserving the bed for the future. After this month it is felony to carry away the cultch, and otherwise punishable to take any oyster, between whose shells, when closed, a shilling will rattle. The reason of the heavy penalty on destroying the cultch is, that, when this is taken away, the ouse will increase, and muscles and cockles will breed on the bed and destroy the oysters, by gradually occupying all the places on which the spawn should be cast. There is likewise some penalty for not treading on, and killing, or throwing on shore, any *Star-fish* (*Asterias* of Linnæus) that happen to be seen.

The prickly *star* creeps on with full deceit,
To force the *oyster* from his close retreat.
When gaping lids their widened void display,
The watchful *star* thrusts in a pointed ray;
Of all its treasures spoils the rifled case,
And empty shells the sandy hillocks grace*.

IV. VERMES, or worms. Their forms are various, and their natures extraordinary. The major part of them are the inhabitants of living animal bodies; their introduction into which is one of those inscrutable mysteries which must for ever evade the power of human intellect. They exist in most animals; some kinds in the intestines, and some in the other viscera. The *external* worms possess an elongated body, composed of rings; have circulating vessels, but no heart. No nerves have been discovered in the intestinal worms.

* Bingley's Animal Biography, vol. iii, p. 452.

ORDER I. INTESTINI, or intestinal worms inhabiting the bodies of animals. The genera are:—1. *Gordius*, guinea-worm. 2. *Ascaris*, thread-worm, round-worm. 3. *Tricocephalus*. 4. *Fasciola*, fluke. 5. *Tænia*, tape-worm. 6. *Hydatid*, hydatid.

ORDER II. EXTERNI, or external worms. The genera are:—1. *Aphrodite*, sea-mouse. 2. *Sipunculus*. 3. *Hirudo*, leech. 4. *Planaria*. 5. *Lumbricus*, earth-worm. 6. *Furia*.

CLASS II.—Insects.

At once came first whatever creeps the ground,
Insect or worm. Those waved their limber fans
 For wings, and smallest lineaments exact
 In all the liveries decked of summer's pride,
 With spots of gold, and purple, azure and green. MILTON.

INSECTS are distinguished from other animals by their being furnished with several feet; never fewer than six, and sometimes with many more; by their breathing, not through lungs, but by spiracles or breathing-holes, situated at certain distances along each side of the body; and, lastly, by the head being furnished with a pair of *antennæ*, or jointed horns, which are extremely various in the different tribes. The first state in which the generality of insects appear, is that of an *egg*. From this is hatched the animal in its second state, in which it is often, but improperly, called the *caterpillar*. The insect, in this state, is the *larva*, or larve, being a mask or disguise of the animal in its future form. The larve differs in its appearance, according to the tribe to which it belongs. When the time arrives for the larve to change into its next state of *chrysalis*, or *pupa*, it ceases to feed, and, having placed itself in some quiet situation for the purpose, lies still for several hours; and then, by a kind of laborious effort, frequently repeated, divests itself of its external skin, or larve-coat, and immediately appears

in the very different form of a pupa*. The pupa emerges at length the complete insect, in its perfect or ultimate form, from which it never can after change, nor can it receive any further increase of growth. This last or perfect state is termed the imago.

So when Rinaldo struck the conscious hind,
He found a nymph in every trunk confined;
The forest labours with convulsive throes,
The bursting trees the lovely births disclose,
And a gay troop of damsels round him stood,
Where late was rugged bark and lifeless wood.

BARBAULD.

Some insects undergo a change of shape, but are hatched from the egg complete, in all their parts, and only cast their skin from time to time, during their growth, till they acquire the full size of their respective species. The mouth, in some tribes, is formed for gnawing or breaking the food, and operates by a pair of strong horny jaws, moving laterally, as in the beetle tribe; while, in others, it is formed for suction, and consists of a sort of tube. In the butterfly and moth tribe, it consists of a double tube, which, when at rest, is rolled into a spiral form, and extended at full length when in use. The eyes differ in the different tribes, but by far the greater part of insects are furnished with eyes apparently two in number, and situated on each side the head. The outward surface of the coats of these eyes may be compared to so many convex lenses or glasses. The head of the *libellula*, or common dragon-fly, is furnished with 25,000 of these diminutive lenses! In *spiders*, the eyes are from six to eight in number; of a simple structure, and placed at a considerable distance from each other.

The *muscles*, or organs constituting the several portions of the flesh in insects, are far more numer-

* The Linnæan term, *pupa*, was given, from the indistinct resemblance which many insects bear in this state to a doll, or a child when swathed up, according to the old fashion.

ous than in the larger animals, and are extremely sensible or irritable. In the human body, the muscles scarcely exceed 500, but, in a large caterpillar, more than 4000 have been discovered! The power of the muscles is also much greater than in animals. A flea is capable of springing at least 200 times its own length; whereas the jerboa and kangaroo, in their most powerful springs, fall very short of the same *proportional* distance.

Search the least path CREATIVE Pow'r has trod,
 How plain the footsteps of th' apparent God!
 His art could organs, strength, and sense implant
 In the small agile *fly*, and reptile *ant*;
 In the mean *mite*, so much minuter still,
 Thy finger's pressing point may millions kill.
 Marked by the magnifying crystal's aid,
 In ev'ry place, what proofs will stand displayed!
 Lo! from the stagnant pool one drop obtain;
 Of insects this includes a sumless train:
 Buoyed in the little pool they frisk and play,
 Pleased with their short existence of a day.
 The little *gnat*, in beauties, may compare
 With all his rival brothers of the air;
 Transparent feathers, purple, green, and gold,
 His wings, small feet, and gay-fringed tail enfold.
 Four sharpened spears his head with weapons arm,
 And his pearly eyes* with liveliest graces charm.
 In down of ev'ry variegated die
 Shines, flutt'ring soft, the gaudy *butterfly*.
 That powder which thy spoiling hand distains,
 The forms of quills and painted plumes contains;
 Not cotirts can more magnificence express,
 In all their blaze of gems and pomp of dress.
 How fine a fur the *spider's* robe supplies,
 Encircled with his brilliant ring, of eyes!
 By one quick glance directing ev'ry way,
 The watchful hunter to secure his prey.
 Thy microscopic glass admiring bring,
 And view the humble *hornet's* sharp'ned sting.

* These are composed of several thousand little hemispheres, or, in reality, are so many distinct eyes; which have such a power of magnifying, and are of such a wonderful structure, in many of the minutest insects, that they are capable of discovering objects many thousand times less than themselves.

Then on the slenderest needle turn thy eye,
 And the vast difference in their points descry :
This viewed, more polished seems, acuter far;
That, rough as from the forge some blunted bar.
 God's smallest work all human skill degrades,
 Foils the lost man, and sinks his worth in shades.

MOSES BROWNE.

Insects are divided into seven orders : *coleoptera*, *hemiptera*, *lepidoptera*, *neuroptera*, *hymenoptera*, *diptera*, and *aptera*.

ORDER I. COLEOPTERA, or insects which have a hollow horny case, under which the wings are folded, when not in use. The genera are :—1. *Scarabæus*, beetles. 2. *Lucanus*, stag-beetle. 3. *Dermestes*. 4. *Coccinella*, lady-bird. 5. *Curculio*, weevil. 6. *Lampyrus*, glow-worm. 7. *Meloe*, spanish-fly. 8. *Staphylinus*. 9. *Forficula*, earwig.

ORDER II. HEMIPTERA, or half-winged insects. In this order, the wing-sheaths are tough or leathery at their upper part, and soft or membranaceous at the lower, and the real or under wings are often of great size, and plaited longitudinally in the manner of a fan. The genera are :—1. *Blatta*, cock-roach. 2. *Gryllus*, locust, grasshopper. 3. *Fulgora*, lantern-fly. 4. *Cimex*, bug, &c.

ORDER III. LEPIDOPTERA, or scaly-winged insects. The powder or down on the wings of these insects has been considered as composed of a kind of *feathers*; but in reality it is composed of a kind of very minute *scales*, which differ in size and form in the different species, as well as on different parts of the same species. The genera are : 1. *Papilio*, butterfly *. 2, 3. *Sphinx* and *Phalæna*, moths.

* Voyez ce papillon échappé du tombeau,
 Sa mort fut un sommeil, et sa tombe un berceau ;
 Il brisa le fourreau qui l'enchaînait dans l'oubli ;
 Deux yeux parurent son front, et ses yeux sont sans nombre ;
 Il se traîna à peine, il part comme l'éclair ;
 Et sautait sur la terre, il volait dans l'air.

Ten thousand different tribes
 People the blaze. To sunny waters come
 By fatal instinct fly.

Through the green-wood glade
 Some love to stray; there lodged, amused, and fed,
 In the fresh leaf. Luxurious, others make
 Thements their choice, and visit every flower,
 And every latent herb.

ORDER IV. NEUROPTERA, or nerve-winged, or fibre-winged insects. This order consists of such as have four large wings, furnished with very conspicuous nerves, fibres, or ramifications dispersed over the whole wing. The genera are: 1. *Libellula*, dragon-fly. 2. *Ephemera*, may-fly, or trout-fly, &c.

ORDER V. HYMENOPTERA, or insects having four wings, but not fibrous like the former order. They generally possess a sting or piercer, which in some is innocent; but in others, it is calculated for the discharge of a highly acrimonious or poisonous juice, as in wasps and bees. The genera are: 1. *Vespa*, wasp, hornet. 2. *Apis*, bee*. 3. *Formica*, ant. 4. *Termes*, white ant. 5. *Ichneumon*, &c.

The flowery leaf
 Wants not its soft inhabitants. Secure,
 Within its winding citadel, the stone
 Holds multitudes. But chief the forest-boughs,
 That dance unnumbered to the playful breeze,
 The downy orchard, and the melting pulp
 Of mellow-fruit, the nameless nations feed
 Of evanescent insects.

ORDER VI. DIPTERA, consists of insects with two wings only, as the whole race of flies strictly so

* As bees

In spring-time, when the Sun with Taurus rises,
 Pour forth their populous youth about the hive
 In clusters; they among fresh dews and flowers
 Fly to and fro, or on the smoothed plank,
 The suburb of their straw-built citadel,
 New rubbed with balm, expatiate and confer
 Their state affairs: so thick the æry crowd
 Swarmed and were straitened.

MILTON.

called, as well as gnats, and a great variety of other insects. The genera are: 1. *Æstrus*, gad-fly. 2. *Musca*, common flies. 3. *Culex*, gnat*, musquito. 4. *Hippobosca*, horse-leech, &c.

In the genus *Æstrus*, or gad-fly, the eggs are laid by the parent in the skin of the backs of cattle, in one species; in others, in the nostrils and other parts of deer and sheep: the *larves*, when arrived at their full size, creep out, and retiring beneath the surface of the grass, or under any convenient body, change into a chrysalis, from which, in a certain space, springs the animal in its ultimate form.

ORDER VII. APTERA, or insects without wings. The genera are: 1. *Podura*, spring-tail. 2. *Pediculus*, louse. 3. *Pulex*, flea, chigger. 4. *Acarus*, tick, mite. 5. *Aranea*, spiders†. 6. *Scorpio*, scorpion. 7. *Cancer*, crab, lobster, craw-fish, shrimp. 8. *Monoculus*, water-flea. 9. *Oniscus*, wood-louse. 10. *Scolopendra*, centipede.

The two genera *cancer* and *monoculus* are *crustaceous*, or have a hard shelly covering. The crabs and lobsters cast their skins annually, the body shrinking before the change, and enabling them easily to draw out their limbs from the shell. The larger kind of crabs possess the extraordinary power of *casting off* at pleasure any *limb* which may be accidentally

* As gentle shepherd in sweet eventide,
When ruddy Phœbus gins to welke in west,
High on a hill, his flocks to viewen wide,
Marks which do bite their hasty supper best,
A cloud of cumbrous *gnats* do him molest,
All striving to infix their feeble stings,
That from their noyance he can no where rest,
But with his clownish hands their tender wings
He brusheth oft, and oft doth mar their murmurings.

SPENSER.

† The *spider's* touch, how exquisitely fine!
Feels at each thread, and lives along the line.

POPE.

maimed or bruised; and a new limb is gradually formed. Like some of the crabs, lobsters are said to be attached to particular parts of the sea*.

CLASS III.—Fishes.

See through this air, this ocean, and this earth,
All matter quick, and bursting into birth;
Above how high progressive life may go,
Around how wide, *how deep* extend below!
Vast chain of being, which from God began;
Nature's ethereal, human, angel, man,
Beast, bird, fish, insect, what no eye can see,
No glass can reach; from infinite to THEE,
From THEE to nothing!

LIKE the amphibious animals, the heart of fishes is unilocular, or consists but of one chief cavity, and their blood is far less warm than that of quadrupeds and birds. The organs of breathing in fishes are called *gills*, and consist of a vast number of blood-vessels. The generality of fishes are covered with scales, of various form and size in the different tribes; which scales are analogous to the hair of quadrupeds and the feathers of birds. The chief instruments of motion, the *fins*, consist of a certain number of elastic rays or processes, either of one single piece, in the form of a spine, or of jointed pieces. The strong, or spiny rays are usually placed at the fore part of the fin, and the soft or jointed rays towards the back part.

* In shelly armour wrapt, the lobsters seek
Safe shelter in some bay, or winding creek;
To rocky chasms the dusky natives cleave,
Tenacious hold, nor will the dwelling leave:
Nought like their home the constant lobsters prize,
And foreign shores and seas unknown despise.
Though cruel hands the banished wretch expel,
And force the captive from his native cell,
He will, if freed, return with anxious care,
Find the known rock, and to his home repair;
No novel customs learn in different seas,
But wonted food and home-sought meats please.

By the various flexures of these organs, the movements of fishes are conducted; the perpendicular fins, situated on the back or upper part of the animal, keeping the body in equilibrio, while the *tail* operates as a *rudder* at the stern of a vessel, and the side or breast-fins as *oars*. The stomach is large, and the intestines far shorter than in quadrupeds and birds: the liver is very large, and usually placed on the left side.

The *air-bladder*, or swimming bladder which occurs in the majority of fishes, is a highly curious and important organ. It generally lies close beneath the back-bone, and is provided with a very strong muscular coat, which gives it the power of contracting at the pleasure of the fish, so as to condense the contained *gas*, or elastic air, with which it is filled, and thus enable the animal to *descend* to any depth, and again to *ascend* by being restored to its largest size. Some fishes are totally destitute of the air-bladder, and are observed to remain always at the bottom; as the whole tribe of what are termed flat-fish. The *teeth* are, in some tribes, very large and strong; in others, very small; in some, sharp; in others, obtuse; in some, very numerous; and in others, very few. Sometimes they are placed in the jaws; sometimes, in the palate or tongue; or, even at the entrance of the stomach. The *eyes* are, in general, large, and very much flattened, or far less convex than in quadrupeds and birds; this structure being better calculated for giving them an easy passage through the water. In return, the central part of the eye, or what is called the crystalline humour, is of a round or globular shape, in order to give the animal the necessary power of vision, and to compensate for the comparative flatness of the cornea.

The organ of *smelling*, in fishes, is large; and the animals have the power of contracting or dilating it at pleasure. This sense is supposed to be extremely acute. The organ of *hearing* differs, in some particulars, from that in other animals, and is modified

according to the nature of the fish. They are entirely destitute of *voice*. The particular kind of sound, which some tribes are observed to produce on being first taken out of the water, is entirely owing to the sudden expulsion of air from their internal cavities. The greater number of fishes are *oviparous*, producing soft eggs, usually known by the name of spawn. There have been 200,000 ova or eggs found in a *carp*; in a *perch*, weighing one pound two ounces, 69,216; in a *carp* of eighteen inches, 342,144; and in a *sturgeon* of one hundred and sixty pounds, there was the enormous number of 1,467,500. The age of fish is determinable by the number of concentric circles of the vertebræ or joints of the back-bone.

The sounds and seas, each creek and bay,
 With *fry* innumerable swarm, and shoals
 Of *fish* that, with their fins and shining scales,
 Glide under the *green wave*, in sculls that oft
 Bank the mid sea: part single or with mate
 Graze the *sea weed* their pasture, and through groves
 Of *coral* stray, or sporting with quick glance
 Show to the Sun their *waved coats dropt with gold*,
 Or, in their *pearly shells* at ease; attend
 Moist nutriment, or under rocks their food
 In *jointed armour* watch; part huge of bulk
 Wallowing unwieldy, enormous in their gait,
 Tempest the ocean.

MILTON.

In the Linnæan arrangement of fishes, the under or belly-fins are termed *ventral*, and are considered analogous to the feet in quadrupeds; and it is from the presence or absence of these fins that the divisions are instituted.

ORDER I. *Apodes*, or footless fishes, are entirely destitute of ventral fins. The genera are: 1. *Muraena*, eel-kind. 2. *Gymnotus*, electric eel. 3. *Anarrhichas*, sea-wolf. 4. *Xiphias*, sword-fish. 5. *Ammodites*, lance. 6. *Ophidium*. 7. *Stromateus*. 8. *Trichiurus*.

ORDER II. *Jugulares*, or jugular fishes, have the ventral or belly-fins placed more forward than the

pectoral or breast fins. The genera are: 1. *Gadus*, haddock, cod, whiting, ling. 2. *Uranoscopus*, stargazer. 3. *Blennius*, blenny. 4. *Callionymus*, dragonet. 5. *Trachinus*, weever.

ORDER III. THORACICI, or thoracic fishes, have the ventral fins situated immediately below the pectoral ones. The genera are: 1. *Gymnetrus*, comet-fish. 2. *Echeneis*, sucking-fish. 3. *Coryphæna*, dorado. 4. *Zeus*, dory. 5. *Pleuronectes*, flounder, plaice, dab, halibut, sole, turbot. 6. *Chætodon*. 7. *Sparus*. 8. *Perca*, perch. 9. *Scomber*, mackerel, bonito, tunny. 10. *Mullus*, mullet*. 11. *Acanthurus*, thorn-tail. 12. *Molocentrus*. 13. *Scicena*. 14. *Trigla*, gurnards.

The ancients absurdly believed that the *sucking-fish* had the power of arresting the progress of a ship in its fastest sailing, by adhering to its bottom.

The *sucking-fish* beneath, with secret chains,
Clung to the keel, the swiftest ship detains.
The seamen run confused, no labour spared,
Let fly the sheets, and hoist the top-mast yard,
The master bids them give her all the sails,
To court the winds, and catch the coming gales.
But, though the canvass bellies with the blast,
And boisterous winds bend down the cracking mast,
The bark stands firmly rooted in the sea,
And will, unmoved, nor winds nor waves obey:
Still, as when calms have flatted all the plain,
And infant waves scarce wrinkle on the main.

* In some parts of the Continent, the fishermen endeavour, by making violent noises, to drive the fish into their nets; but these are so cunning, that, when surrounded with the net, the whole shoal will sometimes escape; for, if one of them springs over it, the rest, like sheep, are sure to follow their leader. This circumstance was noticed by Oppian:

The mullet, when encircling seines inclose,
The fatal threads and treach'rous bottom knows;
Instant he rallies all his vigorous powers,
And faithful aid of every nerve implores;
O'er battlements of cork up-darted flies,
And finds from air th' escape that sea denies.

No ship in harbour moored so careless rides,
 When ruffling waters tell the flowing tides.
 Appalled, the sailors stare, through strange surprise,
 Believe they dream, and rub their waking eyes.
 As when, unerring from the huntsman's bow,
 The feathered death arrests the flying doe,
 Struck through, the dying beast falls sudden down,
 The parts grow stiff, and all the motion's gone;
 Such sudden force the floating captive binds,
 Though beat by waves, and urged by driving winds.

ORDER IV. ABDOMINALES, or abdominal fishes, have the ventral fins placed below the pectoral ones, and chiefly inhabit fresh water. The genera are: 1. *Cobitis*, loach. 2. *Silurus*. 3. *Exocoetus*, flying-fish. 4. *Salmo*, salmon, trout, smelt, char, grayling. 5. *Esox*, pike. 6. *Clupea*, herring, sprat, shad. 7. *Cyprinus*, carp, tench, gold-fish, minnow.

The following lines are poetically expressive of the danger in which smaller fishes are at the approach of the *pike*:

Beware, ye harmless tribes, the tyrant comes,
Exclaims the silver-mantled naiad of the pond;
Beware, ye flirting gudgeons, barbels fair,
And ye, quick-swimming minnows, gliding eels,
And all who breathe the lucid crystal of the lake,
Or lively sport between the dashing wheels
Of river mills, beware; the tyrant comes!
Grim death awaits you in his gaping jaws,
*And lurks behind his hungry fangs—beware!**

CARTILAGINOUS FISHES, improperly admitted into the amphibia by Linnæus, differ from the rest of the fish tribe, in having a cartilaginous or sinewy, instead of a bony skeleton, and in being destitute of ribs. They are divided into two orders, chondropterygii, and branchiostegi.

ORDER I. CHONDROPTERYGII, or such as have no gill-cover. The genera are: 1. *Petromyzon*, lamprey. 1. *Gastrobranchus*. 3. *Raia*, skate, torpedo, sting-ray. 4. *Squalus*, shark, saw-fish. 5. *Lophius*,

* See M'Quin's pleasing 'Description of Three Hundred Animals,' p. 257.

sea-devil, frog-fish, 6. *Balistes*, file-fish. 7. *Chimaera*,

The properties of the *Torpedo* have been described by Oppian; but, with that liberty to which poets always conceive themselves entitled, he has endowed it with the power of benumbing the fisherman through the whole length of his line and rod.

The hooked *torpedo* ne'er forgets his art,
But soon as struck, begins to play his part;
And to the line applies his magic sides:
Without delay the subtle power glides
Along the pliant rod and slender hairs,
Then to the fisher's hand as swift repairs:
Amazed he stands, his arms of sense bereft,
Down drops the idle rod, his prey is left;
Not less benumbed than had he felt the whole
Of frost's severest rage beneath the Arctic pole.

ORDER II. BRANCHIOSTEGI, or having a gill-cover. The genera are: 1. *Accipenser*, sturgeon, beluga. 2. *Ostracion*, trunk-fish. 3. *Tetrodon*. 4. *Diodon*, porcupine-fish. 5. *Cyclopterus*, lump-sucker. 6. *Centriscus*. 7. *Syngnathus*, pipe-fish. 8. *Pegasus*.

The class of PISCES, or fishes, which, in the preceding arrangement, is subdivided into six orders, has, by several naturalists, been limited to two: fishes with an osseous or spinous skeleton; and fishes with a cartilaginous skeleton; the former including the first four orders of Linnaeus, and the latter the last two.

The first peculiarity that strikes us, with regard to the fishes of the spinous order, is the extent of their numbers. Not only are the individuals of each family more numerous, but the variety of the kinds is also far greater. Upwards of seven hundred different species of spinous fishes are already known and described; while the whales and the cartilaginous fishes, when taken together, hardly amount to a fifth of that number. The former are, in general, inferior in size; and it is conformable to a law, which obtains in every department of the animal kingdom, that the

smaller the productions of nature are, the more numerous and diversified in form does she yield them. A very valuable purpose in the economy of Providence is gained by this constitution of the animal kingdom; for, since the smaller tribes are in general destined to become the prey of the larger, an adequate provision is made for the supply of every kind; none entirely perishes through want; none is ultimately extirpated through depredation.

It is by the *numbers*, therefore, of the spinous fishes that the other orders are preserved, and their own perpetuated. In them generation is formed, not by producing a living animal, or by hatching a distinct egg, but by spawning innumerable ova, that are quickened into life by the heat of the sun, and are destined to supply the annual waste of millions. Hence the powers of *fecundity* in this division exceed belief, and in a short space defy calculation. A single *herring*, if suffered to multiply unmolested, and undiminished for twenty years, would show a progeny greater in bulk than the globe itself. It is owing to this exuberant fertility that the herring, the pilchard, and some others, are obliged to migrate annually from the arctic regions, in shoals of such vast extent, that for miles they are seen to darken the surface of the water.

But the amazing propagation of fishes, which we witness along our coasts and rivers, bears no proportion to the vast quantities that swarm in the warmest latitudes of the Indian ocean. The inhabitants of some of the islands there are under no necessity of providing instruments for fishing: as fish tribes approach the shore, they are found in great numbers, in the splashies, where the water remains after the ebbing of the tide. In some places where these swamps are dried up by the sun, they are left in such shoals, that they communicate, by their putrefaction, a noxious and unhealthy influence to the atmosphere.

Happily, however, for the purity of the ocean, and

the health of those beings which it supports in life, the waste of these fishes is nearly proportioned to their fecundity; and the balance of nature is exactly preserved. The *shark*, the *porpoise*, and the *cod*, we ought therefore to consider not so much in the light of plunderers and rivals as that of benefactors to mankind. Without their exertions the sea would soon be overcharged with the burthen of its own inhabitants; and that element, which at present distributes health and plenty to the shore, would in a short time load it with putrefaction.

The general character by which naturalists distinguish the spinous fishes from the cartilaginous is that bony *operculum*, which, in this order, universally covers the gills on each side. By these coverings the gills are alternately opened and shut; and the spinous fishes breathe by these organs alone. Hence, as these animals partake less of the conformation of quadrupeds than either the cartilaginous or the cetaceous tribes, they can in general remain only a shorter time out of their proper element. When taken from the water, they testify their sufferings by panting more violently, and at closer intervals; the thin air furnishes not their gills with proper play, and in a few minutes they expire.

But the spinous tribes are not all equally incapable of supporting life in the open air. The *eel* will live several hours out of water; and the *carp* has been known to be fattened in a damp cellar. The manner in which this process is conducted, is by putting the animal in a net, wrapt up in wet moss, the mouth only disengaged, for the convenience of feeding: the nourishment which agrees best with it is white bread and milk; and upon this food it will fatten more rapidly, and become better flavoured than when fed in the pond. It is necessary, however, that the net be dipped frequently in water, and kept hanging in a damp vault.

The *cartilaginous* fishes, though not so remarkable

either for fatness or size, are in general more voracious than any of the tribes we have already reviewed; their *livers* are indeed fat, and are sometimes employed for the production of oil; it is not, however, from them that man derives either his most pleasant or salubrious food; they are impure and immoderate feeders, and their flesh savours of impurity. Of a considerable portion of them the mouth is placed below the head; a contrivance of nature, for which an old writer assigns a curious reason: their snout, says he, is too small to be divided; and their voracity is so keen, that their own life requires that it should not be allowed a ready or complete gratification.

In consequence of this conformation of the mouth, a great part of the cartilaginous fishes are obliged to turn their back downwards in laying hold of their prey; a circumstance that requires time, and affords an opportunity to the smaller fishes to make their escape. They devour every kind of fish or flesh, and to their extraordinary voracity, had nature granted the power of easily apprehending their food, the other kinds must long ago have been altogether extirpated from their gluttony*.

CLASS IV.—*Amphibia*.

Almighty Being!

Cause and support of all things, can I view

These objects of my wonder; can I feel

These fine sensations, and not think of THEE!

THIS class includes all animals who live with equal facility on land or in water, and some others which do not exactly conform to this description. The *amphibia*, from the structure of their organs, and the power they possess of suspending respiration at pleasure, can support a change of element uninjured, and endure a very long abstinence. The *lungs* differ wide-

* See the ingenious and well-written article '*Zoology*,' in the '*PANTOLOGIA*,' or Dictionary of Arts and Sciences.

ly in appearance from those of other animals. Many of the amphibia are possessed of a high degree of productive power, and will be furnished with new feet, tails, &c. when, by any accident, those parts have been destroyed. Their bodies are sometimes defended by a hard, horny shield, or covering; sometimes by a coriaceous or leathery integument; sometimes by scales, and sometimes have no particular coating. The amphibia, in general, are extremely tenacious of life, and will continue to move and exert many of the animal functions, even when deprived of the head itself. By far the greater part are *oviparous*, some excluding eggs, covered with a hard or calcareous shell, like those of birds; others, such as are covered only with a tough skin, resembling parchment; and in many, they are perfectly gelatinous, without any kind of external covering, as in the spawn of a common frog. The amphibia are divided into REPTILIA, containing the *amphibia pedata*, or footed amphibia; and the *serpentes*, or footless amphibia. In the REPTILIA, there are four genera: 1. *Testudo*, tortoise, turtle. 2. *Rana*, frog*, toad. 3. *Draco*, dragon, or flying lizard†. 4. *Lacerta*, lizards, crocodile, chameleon, newt, salamander, iguana.

Along these lonely regions, where, retired
From little scenes of art, great NATURE dwells
In awful solitude, and nought is seen
But the *wild herds* that own no master's stall,
Prodigious rivers roll their fatt'ning seas;
On whose luxuriant herbage, half concealed,
Like a fall'n cedar, far-diffused his train,
Cased in green scales, the CROCODILE extends.

THOMSON.

* When this animal is in the tadpole state, before it has lost its tail, the circulation of the arterious and venous blood may be distinctly seen, by a good microscope.

† The very name of *flying-dragon*, says Dr. Shaw, conveys to the mass of mankind the idea of some formidable monster, and recalls to the imagination the wild fictions of romance and poetry; but the animal, distinguished by that title in modern natural history, is a small harmless lizard.

Few animals have been more celebrated by natural historians than the *Chamæleon*, which has been sometimes said to possess the power of changing its colour at pleasure, and of assimilating it to that of any particular object or situation. This, however, must be received with great limitations; the change of colours which this animal exhibits varying in degree, according to circumstances of health, temperature of the weather, and many other causes, and consisting chiefly in a sort of alteration of shades, from the natural greenish or bluish grey of the skin into pale yellowish, with irregular spots or patches of dull red. The *chamæleon* is a creature of a harmless nature, and supports itself by feeding on insects, for which purpose the structure of the tongue is finely adapted, consisting of a long missile body, furnished with a dilated and somewhat tubular tip, by means of which the animal seizes insects with great ease, darting out its tongue in the manner of a woodpecker, and retracting it instantaneously with the prey secured on its tip. It can also support a long abstinence, and hence arose the idea of its being nourished by air alone. It is found in many parts of the world, and particularly in India and Africa, and also in Spain and Portugal. One that was kept alive in Liverpool, was regularly fed with sugar and bread, and appeared to have an affection for the person who had the care of it. Its change of form was as remarkable as that of colour.—(*Companion to Mr. Bullock's Museum*, p. 93.)

Serpents.

On his rear,
Circular base of rising folds, that towered
Fold above fold, a surprising maze, his head
Crested aloft, and carbuncle his eyes.
With burnished neck of verdant gold, erect
Amidst his circling spires, that on the grass

Floated redundant; , pleasing was his shape.
And lovely——— Oft he bowed.
His turret crest, and sleek enamelled neck,
Fawning, and licked the ground whereon she trod.

MILTON.

The SERPENTES; or serpents, are generally distinguishable from the rest of the amphibia by their *total want of feet*. One of the most singular properties of the serpent tribe, is that of *casting their skin* from time to time. When this takes place, so complete is the spoil or coat-skin, that even the external coat of the *eyes* themselves makes a part of it. Among the *poisonous* serpents, the fangs or poisonous teeth are always of a tubular structure, and furnished with a small hole or slit; near the tip,—they are rooted into a particular bone, so jointed to the remainder of the jaw on each side, as to permit the fangs or poisoning teeth to be raised or depressed at the pleasure of the animal. Above the root of each is a glandular reservoir of poison, which, in the act of biting, is pressed into the tube of the tooth, and discharged into the wound through the hole near the tip. The genera are: 1. *Crotalis*, rattlesnake. 2. *Boa*, immense serpents of India and Africa. 3. *Coluber*, viper. 4. *Anguis*, blind-worm. 5. *Amphisbæna*. 6. *Cæcilia*. 7. *Acrochordus*. 8. *Hydrus*. 9. *Langaya*. 10. *Siren*.

DE LILLE, in his '*Trois Règnes de la Nature*,' has admirably described the various motions of the serpent:—

Il court, nage, bondit, gravit, vole, ou serpente;
Tantôt, au bruit lointain des agrestes pipeaux,
Caché dans la moisson, il attend les troupeaux,
Et des plis écaillés qu'avec force il déploie,
Saisit, étreint, étouffe, et dévore sa proie.
Le chevreau, la brebis, souvent un bœuf entier,
Tout à coup engloutis dans son large gosier.

CLASS V.—Birds.

The *eagle* and the *stork*
 On cliffs and cedar tops their eyries build :
 Part loosely wing the region, part more wise
 In common, ranged in figure wedge their way,
Intelligent of seasons, and set forth
 Their æry caravan high over seas
 Flying, and over lands with mutual wing
 Easing their flight ; so steers the prudent *crane*
 Her annual voyage, borne on winds ; the air
 Floats as they pass, fanned with unnumbered plumes :
 From branch to branch the smaller birds with song
 Solaced the woods, and spread their painted wings
 Till ev'n, and then the solemn *nightingale*
 Ceased warbling, but all night tuned her soft lays :
 Others on silver lakes and rivers bathed
 Their downy breast : the *swan* with arched neck
 Between her white wings mantling proudly, rows
 Her state with oary feet ; yet oft they quit
 The dank, and, rising on stiff pennons, tower
 The mid æreal sky : others on ground
 Walked firm ; the crested *cock* whose clarion sounds
 The silent hours, and th' other whose gay train
 Adorns him, coloured with the florid hue
 Of *rainbows* and *starry eyes*.

MILTON.

THE skeleton or bony frame of birds is, in general, of a lighter nature than in quadrupeds, and is calculated for the power of flight : the spine is immoveable, but the neck lengthened and flexible : the breast-bone very large, with a prominent keel down the middle, and formed for the attachment of very strong muscles. The bones of the wings are similar to those of the fore legs in quadrupeds, but the termination is in three joints or fingers only, of which the exterior one is very short. What are commonly called the *legs*, are analogous to the hind legs in quadrupeds, and they terminate in general in four toes, three of which are commonly directed forwards, and one backwards ; but in some birds there are only two toes, in some, only three. All the bones in birds are much lighter, or with a larger cavity, than in quadrupeds.

The *feathers* with which birds are covered, resemble in their nature the *hair* of quadrupeds, being composed of a similar substance appearing in a different form. 'Every single feather (says Dr. Paley) is a *mechanical wonder*. If we look at the quill, we find properties not easily brought together,—strength and lightness. I know few things more remarkable than the strength and lightness of the very pen with which I am now writing. If we cast our eye toward the upper part of the stem, we see a material made for the purpose, used in no other class of animals, and in no other part of birds; tough, light, pliant, elastic. The pith, also, which feeds the feathers, is neither bone, flesh, membrane, nor tendon.

'But the most artificial part of a feather is the beard, or, as it is sometimes called, the *vane*; which we usually strip off from one side, or both, when we make a pen. The separate pieces of which this is composed are called threads, filaments, or rays. Now the first thing which an attentive observer will remark is, how much stronger the beard of the feather shows itself to be when pressed in a direction perpendicular to its plane, than when rubbed either up or down in the line of the stem; and he will soon discover, that the threads of which these beards are composed are flat, and placed with their flat sides towards each other; by which means, while they easily bend for the approaching of each other, as any one may perceive by drawing his finger ever so lightly upwards, they are much harder to bend out of their plane, which is the direction in which they have to encounter the impulse and pressure of the air, and in which their strength is wanted. It is also to be observed, that when two threads, separated by accident or force, are brought together again, they immediately reasp. Draw your finger down the feather which is against the grain, and you break, probably, the junction of some of the contiguous threads; draw your finger up the feather, and you restore all things to their former state.

‘It is no common mechanism by which this contrivance is effected. The threads or laminæ above mentioned are interlaced with one another; and the interlacing is performed by means of a vast number of fibres or teeth which the threads shoot forth on each side, and which hook and grapple together.

‘Fifty of these fibres have been counted in one twentieth of an inch. They are crooked, but curved after a different manner; for those which proceed from the thread on the side toward the extremity of the feather are longer, more flexible, and bent downward; whereas those which proceed from the side toward the beginning or quill-end of the feather, are shorter, firmer, and turned upward. When two laminæ, therefore, are pressed together, the crooked parts of the long fibres fall into the cavity made by the crooked parts of the others; just as the latch which is fastened to a door enters into the cavity of the catch fixed to the door-post, and there hooking itself, fastens the door!’

Beneath, or under the common feathers or general plumage, the skin in birds is immediately covered with a much finer or softer feathery substance, called *down*. The *throat*, after passing down to a certain distance, dilates itself into a large membranaceous bag, answering to the stomach in quadrupeds: it is called the *crop*, and its great use is to soften the food taken into it, in order to prepare it for passing into another strong receptacle, called the *gizzard*. This, which may be considered as a more powerful stomach, consists of two very strong muscles, lined and covered with a strong tendinous coat, and furrowed on the inside*. In this receptacle the food is completely ground and reduced to a pulp. The *lungs* of birds differ from those of quadrupeds in not being loose or free in the breast, but fixed to the bones all the way down:—they consist of a pair of large spongy bodies,

* In the birds of prey or *accipitres* this is wanting, the stomach being allied to that of quadrupeds.

covered with a membrane, which is pierced in several places, and communicates with several large vesicles or air-bags, dispersed about the cavities of the body.

The *eyes* of birds are more or less convex in the different tribes; and, in general, it may be observed, that the sense of *sight* is more acute in birds than in most other animals. Birds have no outward *ear*, but the internal one is formed on the same general plan as in quadrupeds. Birds are *oviparous* animals, always producing *eggs*, from which the young are afterwards excluded. The first appearance of the young, as an organized body, begins to be visible in six hours after the egg has been placed in a proper degree of heat, under the parent animal. The *chick*, or young bird, when arrived at its full size, and ready for hatching, is, by nature, provided with a small and hard protuberance at the tip of the bill, by which it is enabled the more readily to break the shell, and which falls off some hours after its hatching.

Birds are divided by Linnæus into six orders:—*accipitres*, *picae*, *passeres*, *gallinae*, *grallae*, and *anseræ*.

ORDER I. ACCIPITRES, are birds of prey, and feed entirely on animal food. The bill is more or less curved, strong, and often covered round the base by a naked membrane, called a *cere*; and on each side, towards the tip, is a projection, forming a kind of tooth, and serving to tear the prey. The wings are large and strong, and the whole body stout and muscular; the legs strong and short, the claws much curved, and sharp-pointed. The *accipitres* are generally remarkable for building a negligent or slightly-formed nest in lofty situations, and laying from two to four eggs. The female in this order is always larger than the male; and the whole tribe, in the language of Linnæus, may be considered as analogous to the order *feræ* among quadrupeds. They are naturally warlike and destructive; and when tamed, a few of them claim importance from their subserviency to our pleasures in the field; a subserviency which

laid a foundation for the now neglected art of falconry. But they are otherwise of no immediate utility to man. The genera are: 1. *Vultur*, vultures. 2. *Falco*, falcon, eagle, hawk *, kite. 3. *Strix*, owl. 4. *Lanius*, shrike or butcher-bird †.

The tawny eagle seats his callow brood
High on the cliff, and feasts his young with blood.
On Snowden's rocks, or Orkney's wide domain,
Whose beetling cliffs o'erhang the western main,
The royal bird his lonely kingdom forms
Amid the gathering clouds and sullen storms:
Through the wide waste of air he darts his sight;
And holds his sounding pinions poised for flight;
With cruel eye premeditates the war,
And marks his destined victim from afar:
Descending in a whirlwind to the ground,
His pinions like the rush of waters sound;
The fairest of the fold he bears away,
And to his nest compels the struggling prey.

BARBAULD.

From yonder ivy-mantled tow'r
The moping owl does to the moon complain
Of such, who, wand'ring near her secret bow'r,
Molest her antient solitary reign.

GRAY.

ORDER II. PICÆ or PIES. The bill is commonly of a slightly compressed and convex form, and they build their nests, or deposit their eggs, in trees. The pies comprehend a numerous assemblage, and are so

- * As in the mountains, fleetest fowl of air,
The hawk darts eager at the dove; she scuds
Aslant; he, screaming, springs and springs again
To seize her, all impatient for the prey:
So fell Achilles constant to the track
Of Hector.

HOMER.

† This small bird is so courageous, that he will attack, combat, and kill much larger birds than himself; and, to manage his tearing them with more ease, he hangs them at a thorn, as a butcher does his beasts at a hook, and dilaniates them at pleasure; from which circumstance the French call him the *lanier*, from the Latin *lanius*, 'a butcher.'

various in their form and habits, that hardly any characters, however general, will apply to them all. They live upon fruits, grains, insects, and flesh. As an article of food, they are generally reckoned impure : their feathers are of little use for any of the purposes of human life. Though they are fond of the vicinity of man, they are the least profitable of his servants ; for they live upon the fruits of his industry, while their death makes no compensation for the mischiefs they have committed. They are noisy, restless, and loquacious ; some of them possess the faculty of imitating the human voice ; and instructing them in the art of speaking, constitutes frequently the amusement of the idle.

Though useless or hurtful to man, birds of this order are, by their remarkable ingenuity, and active habits, well fitted for society.

Both male and female unite their labours in building their nests ; and, in general, both are employed alternately in the duty of incubation. When the young are produced, they are abundantly supplied by the joint labours of both parents. They are peculiarly distinguished for establishing a kind of government for the general safety of the society. One bird watches for the whole flock, while it is feeding ; and among the crows, there has been observed a sort of distributive justice, by which every individual is punished for his offences against the laws of the society.

As they in general live by pilfering from the property of man, all the tribes are marked by a look of archness and cunning ; they are able to elude more successfully than other birds all the efforts of man to destroy them ; efforts, which, from their frequent pilrages, he is continually obliged to practise. In the *jackdaw* the habit of thieving seems to be instinctive ; for, even in his domestic state, when placed above the reach of necessity, he carries off to his nest every toy or glittering substance which he can find. A whole family has been alarmed at the loss of a ring ; every

servant has been accused; and all in the house, conscious of their own innocence, have been suspecting each other, when, to their surprise, the abstracted goods have been found in the nest of a tame *magpie* or jackdaw, which, though alone guilty, had alone escaped suspicion.

The genera of the order *PICÆ* are: 1. *Buceros*, rhinoceros-bird. 2. *Ramphastos*, toucan. 3. *Psittacus*, parrot-kind. 4. *Picus*, wood-pecker. 5. *Paradisea*, birds of paradise. 6. *Alcedo*, king-fisher. 7. *Cuculus*, cuckoo. 8. *Trochilus*, humming-bird. 9. *Corvus*, crow, raven, jackdaw, magpie, jay. 10. *Coracias*, roller.

It would be difficult to produce a more pathetic incident from the records of animal life, or one described with a happier selection of circumstances, than that of the halcyon (the *king-fisher* of the antients) being deprived of her young, as told by Valerius Flaccus.

As when from shelter of an arching rock,
Sea-beat, the flood bears off a *halcyon's* nest
With all her unfledged brood; the wretched dam
Hovering above, plains to the swelling waves,
Resolved to follow wheresoe'er they waft
The precious freight: and dares and fears by turns;
Till, battered by the tide, the fragile house
Sinks in the whelming flood: a piercing cry
Attests her grief: she soars, and quits the scene.

Of all animated beings, the *humming-bird* is the most elegant in form and superb in colours. The precious stones, polished by art, cannot be compared to this jewel of nature. Her miniature productions are ever the most wonderful; she has placed in it the order of birds, at the bottom of the scale of magnitude; but all the talents that are only shared amongst the others, she has bestowed profusely on this little favourite. The emerald, the ruby, and the topaz, sparkle in its plumage, which is never soiled by the dust of the ground. It is inconceivable how much these brilliant birds add to the high finish and beauty of the western landscape. No sooner is the sun

risen, than numerous kinds are seen fluttering abroad : their wings are so rapid in motion, that it is impossible to discern their colours, except by their glittering ; they are never still, but continually visiting flower after flower, and extracting the honey. For this purpose they are furnished with a forked tongue, which enters the cup of the flower, and enables them to sip the nectared tribute ; upon this alone they subsist. In their flight they make a buzzing noise, not unlike a spinning-wheel ; whence they have their name.

The *ourisia*, bee-like in its size,
Humming from flow'r to flow'r delighted flies,
And in a wondrous living rainbow drest,
Shifts all its colours on its wings and breast.

M. BROWNE.

The nests of these birds are not less curious than their form : they are suspended in the air at the extremity of an orange branch, a pomegranate, or a citron tree, and sometimes even to a straw pendent from a hut, if they find one convenient for the purpose. The female is the architect, while the male goes in quest of materials, such as fine cotton, moss, and the fibres of vegetables. The nest is about the size of half a walnut. They lay two eggs at a time, and never more, in appearance like small peas, as white as snow, with here and there a yellow speck. The time of incubation continues twelve days, at the end of which the young ones appear, being then not larger than a blue-bottle fly. 'I could never perceive (says Father Dutertre) how the mother fed them, except that she presented the tongue covered entirely with honey extracted from flowers.' Those who have tried to feed them with syrups could not keep them alive more than a few weeks ; these aliments, though of easy digestion, are very different from the delicate nectar collected from the fresh blossoms. It has been alleged by various naturalists, that during the winter season they remain torpid, suspended by the bill from the bark of a tree, and are

awakened into life when the flowers begin to blow ; but these fictions are rejected, for Catesby saw them through the year at St. Domingo and Mexico, where nature never entirely loses her bloom. Sloane says the same of Jamaica, only that they are more numerous after the rainy season ; and prior to both, Marcgrave mentions them as being frequent the whole year in the woods of Brazil.

The method of obtaining these minute birds is to shoot them with sand, or by means of the trunk-gun ; they will allow one to approach within five or six paces of them. It is easy to lay hold of the little creature while it hums at the blossom. It dies soon after it is caught, and serves to decorate the Indian girls, who wear two of these charming birds as pendants from their ears. The Indians, indeed, are so struck and dazzled with the brilliancy of their various hues, that they have named them *the Beams, or Locks of the Sun*. Such is the history of this little being, who flutters from flower to flower, breathes their freshness, wantons on the wings of the cooling zephyrs, sips the nectar of a thousand sweets, and resides in climes where reigns the beauty of eternal spring*.

Le charmant colibri

Qui, de fleurs, de rosée et de vapeurs nourri,
Jamais sur chaque tige un instant ne demeure ;
Glisse et ne pose pas, suce moins qu'il n'effleure :
Phénomène léger, chef-d'œuvre aérien
De qui la grâce est tout, et le corps presque rien,
Vif, prompt, gai, de la vie aimable et frêle esquisse ;
Et des dieux, s'ils en ont, le plus charmant caprice.

DE LILLE.

ORDER III. PASSERES. The bill is formed so as to operate in the manner of a forceps : their limbs are

* ' Companion to Mr. Bullock's Museum, Piccadilly,' p. 66. In this delightful repository of natural history, there is a case containing more than one hundred humming-birds, the finest collection in Europe of this beautiful little creature.

rather weak ; their flight quick, with a frequent repetition of the movement of the wings, and they chiefly build in trees or shrubs. They excel in the art of *nidification*, or constructing their nests. Their food is either animal or vegetable ; some live chiefly on insects, some on seeds, and some on both.

The order of *passeres*, or small singing birds, is by Linnæus considered as analogous to the order *glires* among quadrupeds. For the most part they are remarkable for their beauty and agility. They are continually in motion, and endowed with the powers of song. They enliven the retired and shady grove by the melody of their voices. Those birds, of the superior order, that interest us by their usefulness, or the fierceness of their habits, such as the poultry, or rapacious kinds, have all harsh and screaming voices. The plaintive accents of the *pigeon*, on the contrary, consist of a soothing tendency, while most of the other beautiful little families we are now to review, insinuate themselves into our affections by their delightful songs, their external beauty, and the familiarity of their manners.

Conscious of enjoying the favour of man, they live with him in some degree of confidence ; and, while the larger birds, from a suspicion dictated by ill treatment, or suggested by guilt, fly to the depth of the forest, and dread the vicinity of man, these hop about the hedges and sides of the woods, seldom removing far from his habitation. This alliance is indeed interested on their part ; for it is only on the cultivated fields, and even around houses and gardens, that they can find, in abundance, those seeds and insects upon which they subsist. In the extensive wilds, or in the depths of the forest, none of those kinds of food that are congenial to their natures is to be found. ' As we enter (says Goldsmith) deeper into the uncultivated woods, the silence becomes more profound : there are none of those warblings, none of those murmurs that awaken attention, till you draw near the habita-

tions of men ; there is nothing of that confused buzz, formed by the united though distant voices of quadrupeds and birds ; but all is profoundly dead and solemn. Now and then, indeed, the traveller may be roused from this lethargy of life by the voice of an heron, or the scream of an eagle ; but his sweet little friends, the warblers, have totally forsaken him.'

The want of food is not the only reason why the small birds do not penetrate into the forest. They avoid these dreary retreats also from the principle of self-preservation. Almost all the rapacious kinds, like robbers, hide themselves in the depths of the woods ; and, if they do not find a desert there, soon make one ; for the passerine tribes fly from their tyranny into the open fields, where, in the vicinity of man, they find that the most audacious of their enemies are afraid to attack them.

When the small birds have taken up their residence in a particular grove or thicket, they seldom remove to any distance from the spot. The wren and the red-breast keep possession of their own hedge, with a perseverance that sometimes proves fatal ; and even those birds of passage, that, at certain seasons of the year, remove to a different part of the country, are remarkable for the very limited range of their flights during the months of visitation. Food is the great cause of all their motions, and, as soon as that is obtained, they resume, in the vicinity of their nest and of their young, their sportive exercises or their song.

As food, however, is not found in equal quantities at all seasons of the year, in every part of the country, a great number of the passerine tribes are obliged to remove in quest of it to very distant countries ; and even those which remain with us the whole year make periodical flights to a different district, at certain seasons. Their vernal flights are probably occasioned by the influence of love. They seem then to be in quest of a secure retreat, where they may obey

that call of nature, and find a proper asylum for their future progeny *.

Some to the holly-hedge
Nestling repair, and to the thicket some;
Some to the rude protection of the thorn
Commit their feeble offspring : the cleft tree
Offers its kind concealment to a few,
Their food its insects, and its moss their nests.
Others apart, far in the grassy dale,
Or roughening waste, their humble texture weave.
But most in woodland solitudes delight,
In unfrequented glooms, or shaggy banks,
Steep, and divided by a babbling brook,
Whose murmurs soothe them all the five-long day,
When by kind duty fixed. Among the roots
Of hazel, pendent o'er the plaintive stream,
They frame the first foundation of their domes ;
Dry sprigs of trees, in artful fabric laid,
And bound with clay together. Now 'tis nought
But restless hurry through the busy air,
Beat by unnumbered wings. The *swallow* sweeps
The slimy pool, to build his hanging house
Intent. And often, from the careless back
Of herds and flocks, a thousand tugging bills
Pluck hair and wool ; and oft, when unobserved,
Steal from the barrow a straw ; till soft and warm,
Clean and complete, their habitation grows.

The business of *bird-catching*, which supports a number of people in the vicinity of London, is founded on the annual removals of those singing birds, which are termed *birds of flight*, in the language of that art. The metropolis affording a ready sale for singing birds, this trade has long been established in its neighbourhood ; where it is carried on at a great expense, and with systematical perfection. The wild birds begin to fly, as birdcatchers term it, in the month of

*. The autumnal flights, on the other hand, which are most numerous, seem to consist of many families, united by the parents, who are then conducting their offspring from the inland parts to the vicinity of the shore, where they may be more amply supplied with winter food.

October, and part of the preceding and following months. The different species of these birds do not make their periodical flights exactly at the same time, but follow one another in succession. The *pipit* commences his flight, every year, about Michaelmas; the *woodlark* next succeeds, and continues his flight till towards the middle of October.

It is remarkable, that, though both these tribes of birds are very easily caught during their flight, yet, when that is over, no art can seduce them to the nets. It has never hitherto been found what is the nature of that *call* by which the tame birds can arrest their flight, and allure them under the nets at that particular season, and at no other. Perhaps it is from their anxiety to carry the tame birds along with them, that these may avoid the severity of the winter. Perhaps, as the tame birds are *males*, it is a challenge to combat; or it may be an invitation to *love*, which is attended to by the females, who are flying above, and who, in obeying it, inveigle the males, along with themselves, into the net. If the last be the case, they are severely punished for their infidelity to their mates; for the *females* are indiscriminately killed by the bird-catcher, while the *male* is made a *prisoner*, and sold at a high price, for his song.

The *flights* of these birds begin at daybreak, and continue till noon. *Autumn* is the time when the birdcatcher is employed in intercepting them on their passage. The nets are about twelve yards long, and two and a half broad. They are spread upon the ground, at a small distance from each other, and so placed, that they can be made to flap suddenly over upon the birds that alight between them. As the wild birds fly always against the wind, the birdcatcher, who is most to the leeward, has a chance of catching the whole flight, if his call-birds be good. A complete set of *call-birds* consists of five or six linnets, two goldfinches, two greenfinches, one woodlark, one redpoll; and, perhaps, of a bullfinch, a yel-

low hammer, a titlark, and an aberdavine. These are placed, in little cages, at small distances from the nets. He has likewise his *flur-birds*, which are placed within the net, and raised or let down according as the wild birds approach.

This, however, is not enough to allure the wild bird down; it must be *called* from the cages by one of the call-birds which are kept there, and which have been made to moult early in the summer, in order to improve their notes. Pennant observes, that there appears a malicious joy in these call-birds, to bring the wild ones into the same state of captivity. After they have seen or heard the approach of the wild birds, which is long before it is perceived by the bird-catchers, the intelligence is announced from cage to cage with the utmost ecstasy and joy. The note by which they invite them down is not a continual song, like what the bird uses in a chamber; but short jerks, as they are called by the birdcatchers, which are heard at a great distance. So powerful is the ascendancy of this call over the wild birds, that, the moment they hear it, they alight within twenty yards of three or four birdcatchers, on a spot which, otherwise, would never have attracted their notice. After the fatal string is pulled, and the nets are clapped over the unsuspecting strangers, should one half of the flock escape, such is their infatuation, that they will immediately after *return to the nets*, and share the same fate with their companions; and should only one bird escape, the unhappy survivor will still venture into danger, till he be also caught; so fascinating is the power which the call-birds have over this devoted race.

All the *hens* that are thus taken are immediately killed, and sold for threepence or fourpence a dozen. Their flesh is so exquisite, that they are regarded as a delicate acquisition to the tables of the luxurious. The taste for small birds is however far from being so prevalent in England as in France and Italy; and even the luxury of the Italians will appear parsimony when

compared with the extravagance of their predecessors, the Romans. Pliny says, that Clodius *Æsopus*, a tragedian of Rome, paid no less a sum than *six thousand eight hundred and forty-three pounds for a single dish of musical birds*; an immense tribute to caprice and gluttony. The highest price given for these singing birds in London is five guineas a piece; a strong proof how much more their *song* is relished here than their *flesh*.

It is remarkable, that the female of no kind of birds, except one or two species of the *loria*, ever sings; that talent being every where else the prerogative of the male. All the laborious functions fall to the lot of the *tender sex*; theirs is the fatigue of incubation, and the principal share in nursing the helpless brood. To alleviate these cares, and to support her under them, nature has given to the *male* the gift of song, and all the little blandishments and soothing arts that can win affection or beguile trouble. These he fondly exerts, even after courtship, on some spray contiguous to the nest, during the time his mate is performing her parental duties. To the *female* this is not only a note of blandishment, but a pledge of her security. While her male continues on the neighbouring tree, to watch and sing, she remains in the nest in full confidence that no danger is near; whereas, if his loud and sportive strains stop all on a sudden, it is a certain signal of some dangerous intrusion, and a warning to her to provide for her escape.

Birds of this order are, in general, much more attentive to the *structure of their nests* than the larger kinds. As the size of their body is smaller, the heat of their nest is in proportion, and must be aided by the warm substances with which their nest is usually lined. As their eggs are much apter to lose their heat than those of superior size, these birds are proportionably more assiduous during incubation; the male constantly supplying the place of his female, and thus preventing the admission of the cold, which would prove fatal to his progeny. The habitation of

these birds is no less cunningly concealed than it is artfully built. Whether on the ground, or in a bush, it is always so covered that it can hardly be seen; and, the better to escape observation, the owners never come out or go in while any one is in view.

It wins my admiration,
To view the structure of that little work,
A bird's nest. Mark it well within, without.
No tool had he that wrought, no knife to cut,
No nail to fix, no bodkin to insert,
No glue to join: his little beak was all,
And yet how neatly finished! What nice hand,
With every implement and means of art,
And twenty years apprenticeship to boot,
Could make me such another? Fondly then
We boast of excellence, whose noblest skill
Instinctive genius foils.

The *strong-billed small birds* feed upon grain. They live upon the property of the husbandman, for which they repay him with their songs. They are not, however, without their use; for they often transport seeds from one district to another, and thus disseminate and vary the vegetable productions of the earth. The *slender-billed tribes* feed mostly upon insects or worms, and are exceedingly useful in destroying part of those superfluous beings with which the atmosphere and the surface of the earth teems, often to the ruin of seeds and tender plants. Their voice is supposed to be still more soft and delicate than that of the other kinds. Even the granivorous birds of this class, while young, live upon insects. During the three first days after their exclusion from the shell, they require little or no food. The parents, however, soon perceive by their loud and plaintive accents, and by their gaping, that they feel the approaches of hunger; and they are eager to gratify their wants by a plentiful supply. In the absence of the parents they continue to lie close together, and cherish each other by their mutual warmth. During this interval also they preserve a perfect silence, uttering not the slightest note till the mother returns. Her arrival is always an-

nounced by a chirrup, which they perfectly understand, and which they answer all together, each petitioning for its portion. The parent distributes a supply to each by turns, cautiously avoiding to gorge them, by giving them often, and but little at a time. The *wren* will in this manner feed *seventeen* or *eighteen* young, although perfectly in the dark, without passing over one of them. A few days after they are fully fledged, and led out by their parents, during which they are taught to pick their food and to fly, they become totally independent of these admonitory aids*.

The different *genera* belonging to the class of *PAS-SERES* are: 1. *Columba*, pigeons. 2. *Turdus*, thrush†, blackbird. 3. *Ampelis*, chatterer. 4. *Loxia*, gross-beak. 5. *Emberiza*, bunting. 6. *Motacilla*, nightingale, redbreast, wren, water-wagtail, taylor-bird. 7. *Hirundo*, swallows, martins. 8. *Caprimulgus*, goat-sucker. 9. *Alauda*, lark. 10. *Sturnus*, starling. 11. *Fringilla*, finches‡, canary-bird, linnet, sparrow.

Up springs the *lark*,
 Shrill-voiced and loud, the messenger of morn;
 Ere yet the shadows fly, he, mounted, sings
 Amid the dawning clouds, and from their haunts
 Calls up the tuneful nations. THOMSON.

Oft in the *wicker-prison* doomed to live
 And sing, suspended at the cottage door,

* See the 'PANTOLOGIA,' or General Dictionary of Arts and Sciences, art. ZOOLOGY.

† The *thrush*
 And *woodlark*, o'er the kind contending throng
 Superior heard, run through the sweetest length
 Of notes. THOMSON.

‡ Now where the thistle blows his feathered seed
 Which frolic zephyrs buffet in the air,
 The crimson-hooded *finches*, on the flowers,
 Spread the pure gold laid on their sable wings
 With conscious pride,—they feed.

Or gently swinging o'er the cobbler's stall,
 The lively, restless *starling*, all the day,
 Chattering and loud, calls to the passing clown,
 And whistles to his brothers of the grove,
 Unmindful of lost liberty.

z.

Soft warbling *linnet*, welcome to the vine
 Whose gentle tendrils curl around my cot.
 So delicate thy notes! thy scarf so bright;
 So keen the eye that through the foliage peeps!
 Sure pledge of spring, thrice welcome to my bow'r.

z.

ORDER IV. GALLINÆ, or poultry kind. This order of birds must unquestionably be regarded as the *most serviceable to mankind* of the whole class. The rapacious kinds administer nothing to his utility, and not much to his amusement. The smaller birds contribute indeed to his amusement by their music, but to little or nothing more than to his amusement. It is from the *poultry tribes alone* that he derives any solid advantages, or considerable accession to the necessities of life.

Birds of this order are distinguished by the comparative smallness of the head; by their heavy and muscular bodies; and the whiteness and salubrity of their flesh. Their bills are short, strong, and arched; the upper mandible shutting over the edges of the lower, and thus fitted for picking up grain, which is their principal nourishment. Their legs are strong and short; their toes furnished with broad claws, for scratching the ground. There are few of them qualified for long flights, or migrating from one country to another, on account of the shortness of their wings.

The variety of food upon which they are capable of subsisting, renders them, in general, proper for domestication; and the fertility, for which they are remarkable, when abundantly supplied with food, enables man to convert them into a mean of adding considerably to the stock of his provisions. Like the ruminant cattle, they are indolent, gregarious, and volup-

tuous : when made prisoners, they forget equally their former companions, and the pleasures of freedom. Satisfied with the single enjoyment of eating, they grow tame, contented, and fat in their confinement ; and are peculiarly fitted for the purposes for which they are destined by their owners.

The various kinds of *domestic fowl* are thus grouped in a truly rural landscape :—

Should I my steps turn to the rural seat,
Whose lofty elms, and venerable oaks,
Invite the *rook*, who high amid the boughs,
In early spring, his airy city builds,
And ceaseless *caws* amusive ; there, well-pleased,
I might the various polity survey
Of the mixt *household kind*. The careful *hen*
Calls all her chirping family around,
Fed and defended by the fearless *cock* ;
Whose breast with ardour flames, as on he walks,
Graceful, and crows defiance. In the pond,
The finely-chequered *duck* before her train
Rows garrulous. The stately-sailing *swan*
Gives out his snowy plumage to the gale ;
And, arching proud his neck, with oary feet
Bears forward fierce, and guards his osier isle,
Protective of his young. The *turkey* nigh,
Loud-threat'ning, reddens ; while the *peacock* spreads
His every-coloured glory to the sun,
And swims in radiant majesty along.
O'er the whole homely scene, the cooing *dove*
Flies thick in amorous chace, and wanton rolls
The glancing eye, and turns the changeful neck.

The genera of the order GALLINÆ are : 1. *Tetrao*, grouse, quail, partridge. 2. *Numida*, guinea-fowl. 3. *Meleagris*, turkey. 4. *Phasianus*, pheasant. 5. *Pavo*, peacock. 6. *Otis*, bustard. 7. *Didus*, dodo. 8. *Struthio*, ostrich. 9. *Casuarius*, cassowary or emu.

The common *bustard* is the largest land fowl which is a native of Britain, measuring nearly four feet in length, and in breadth nine. The head and neck are ash-coloured, the back is transversely barred with black and bright ferruginous, and the belly is white. On each side of the lower mandible is a tuft of fea-

thers, about nine inches long. The female is only about half the size of the male, and her colours are less bright. The bustard is sometimes seen in Dorsetshire, on Salisbury Plain, near Newmarket, and on the Wolds of Yorkshire, but has of late years become very rare. It is of a timid and solitary disposition, runs swiftly, takes wing with difficulty, and therefore is commonly hunted with dogs. It feeds on seeds, herbage, and worms.

In the thirty-ninth chapter of Job, there is a most beautiful description of the *ostrich*. They had at that time observed the manner in which the female ostrich abandons her brood to the natural heat of the sand : *'She is hardened against her young ones, as though they were not her's. Her labour is in vain ; without fear, because God hath deprived her of wisdom ; neither has he imparted to her understanding. What time she lifteth up her head on high, she scorneth the horse and his rider.'*

ORDER V. GRALLÆ or WADERS. The bill is generally rather long, the legs lengthened, and the thighs often bare of feathers above the knee. Their chief residence is in watery situations, and their food consists of various kinds of aquatic animals, though some feed also on vegetable substances. Their nests are often on the ground, but sometimes on tall trees. Though incapable of launching out into the vast ocean, they all venture into the lakes and rivers by swimming. Some of them, as the *coots* and *grebes*, reside upon the water almost constantly, being incapable of walking to any distance on the shore. In the power of flight they are almost as defective as in walking. In consequence of these limited powers their journeys are commonly short, being only from one lake to another ; they are performed, too, mostly during night, with great effort and difficulty.

Several of the pinnated tribes are endowed with a capacity of seeing in the night, like the owls. At that season they gather their food, and perform the

most important functions of their economy. This quality is not indeed peculiar to them alone; for it is shared, in a greater or less degree, by almost the whole of the water-fowls. Thus accomplished, they issue forth from the reeds along the lakes and shores, when the finny tribes are at rest, and plunder and devour them without molestation. The different genera of these birds are variously endowed with aquatic powers: while some are confined to rivers and lakes, others venture into the sea, and engage in a wider range of depredation upon the shores.

As the *duck* is the most useful of all the inhabitants of the water, so nature has happily multiplied this genus more than any other aquatic tribes. It appears in a thousand varieties; and the numbers of each species far exceed all computation. The water-fowls, of which this forms the chief, that frequent the shores of Europe, are prodigious: but still they bear no proportion to those immense flocks that swarm upon the shores of the American continent; where the numbers of the human race are fewer, and their dominion over the animal world far less extensive before they became acquainted with the use of fire-arms.

The water-fowls are mostly all fit for food, though the flesh of none of them be so palatable as that of the gallinaceous or passerine orders. It uniformly contracts a rancid and oily taste, from the nature of the food upon which these birds subsist. This taste still, in some measure, remains in the flesh of the goose and the duck, which all the arts of domestication are not able to remove. It is, however, much lessened by confining these birds to the land, and feeding them with grain.

The *aquatic tribes* seem not even bounded in their residence by the limits of the land itself. The floating mountains of ice towards the poles afford them a retreat during tempestuous weather, and a cradle for their young. They require no grain or vegetable

food, which nature in these frozen regions cannot produce. Hence they have been seen fixing their residence upon these islands of ice in the same manner as upon land. There they sleep; there too they sometimes hatch their young*.

Who the various nations can declare
That plough with busy wing the peopled air?
These cleave the crumbling bark for insect food;
Those dip the crooked beak in kindred blood;
Some haunt the rushy moor, the lonely woods;
Some bathe their silver plumage in the floods;
Some fly to man, his household gods implore,
And gather round his hospitable door,
Wait the known call, and find protection there
From all the lesser tyrants of the air. BARBAULD.

The genera of the class GRALLÆ are: 1. *Ardea*, crane, stork, heron †, bittern. 2. *Mycteria*, jabiru. 3. *Tantalus*, ibis. 4. *Numenius*, curlew. 5. *Parra*, jacuna. 6. *Psophia*, trumpeter. 7. *Platalea*, spoon-bill. 8, 9. *Tringa* and *Charadrius*, snipe and plover tribe. 10. *Phœnicopterus*, flamingo.

ORDER VI. ANSERES consist of such birds as have very strongly or conspicuously webbed feet, and are, from their general structure, calculated for swimming. The feet, in all, are very widely webbed, the legs strong and short, and the whole body stout, fat, and muscular. Their food consists of fish and other water-animals, and frequently of water-plants. Their rest is generally on the ground, but sometimes on lofty rocks. The genera are: 1. *Colymbus*, diver. 2. *Larus*, gull. 3. *Procellaria*, petrel. 4. *Diomedea*, albatross. 5. *Pelecanus*, pelican, cormorant. 6.

* See 'PANTOLOGIA,' art. ZOOLOGY.

† When watchful *herons* leave their wat'ry stand,
And mounting upwards with erected flight,
Gain on the skies, and soar above the sight.

DRYDEN.

Anas, swan, duck, goose*. 7. *Mergus*, goosander.
8. *Alca*, awk, puffin. 9. *Aptenodytes*, penguin.

Cormorants were formerly tamed in England for the purpose of catching fish, as the falcons and hawks for chasing the fleet inhabitants of the air. We are told that the custom is still in full practice in China. This bird, although of the aquatic kind, is often seen, like the pelican, perched upon trees; and Milton tells us that Satan,

On the tree of life,
The middle tree, and highest there that grew,
Sat like a *cormorant*.

CLASS VI.—*Mammalia*.

Out of the ground up rose,
As from his lair, the *wild beast* where he wons
In forest wild, in thicket, brake, or den;
Among the trees in pairs they rose, they walked:
The cattle in the fields and meadows green:
Those rare and solitary, these in flocks
Pasturing at once, and in broad herds upsprung.
The grassy clods now calved; now half appeared
The tawny *lion*, pawing to get free
His hinder parts, then springs as broke from bonds,
And rampant shakes his brinded mane; the *ounce*,
The *libbard*, and the *tiger*, as the *mole*
Rising, the crumbled earth above them threw
In hillocks: the swift *stag* from under ground
Bore up his branching head: scarce from his mould
Behemoth, biggest born of earth, upheaved
His vastness: fleeced the *flocks* and bleating rose,
As plants.

MILTON.

THE MAMMALIA are so named from their being provided with *mammæ*, or teats, for the purpose of suckling their young; which circumstance sufficiently distinguishes them from all other animals. They are also called *viviparous* quadrupeds, as producing perfectly formed living young; in opposition to what were

* The silver *goose* before the shining gate
There flew, and by her cackle saved the state,

DRYDEN.

formerly termed *oviparous*, or egg-producing quadrupeds, as tortoises, lizards, &c. The following are the general characters of the mammalia. They have warm and red blood. Their *skeleton*, as well as their *internal organs*, resemble, in a great degree, those of man. Their outward covering consists, in general, of *hair*, but, in some few, the animal matter or substance takes the form of distinct *spines* or *quills*, as in the porcupine and hedgehog tribe. In other mammalia, the same substance is expanded into the appearance of very strong and broad *scales*, as in the quadrupeds of the genus *manis* or pangolin. In the armadillos, instead of hair, we meet with *strong bony zones* or bands, forming a regular suit of armour, and securing the animal from all common injuries.

The *feet*, in the mammalia, are generally four in number, and furnished with separate toes or divisions, guarded by claws more or less strong in the different tribes. In the *monkeys*, the feet have the appearance of hands; and the claws often bear a great resemblance to the human nails. In some tribes of mammalia, the feet are armed or shod with strong hoofs, either quite entire, or cloven or divided. In the *bat* tribe, the fore feet are drawn out into slender fingers of an immoderate length, and united by a common membrane or web. In *seals*, both the hind and fore feet are very strongly or widely webbed; and in the *whales*, there are in reality only two feet, the bones of which are inclosed in what are commonly called the fins, while the lobes of the tail, in some degree, answer the purpose of a pair of hind feet, but consist merely of strong muscles and tendons, without any internal joints or bones. The *arms*, or offensive and defensive weapons of the mammalia, besides the claws and teeth, are principally the *horns*, which are either perennial, or during the animal's life, or annual. The *teeth* are of three kinds. (1.) Front or cutting teeth, of a broad, compressed structure, designed for cutting their food. (2.) Sharp, lengthened, or ca-

nine teeth, situated on each side the cutting teeth, and calculated for tearing and dividing the food. (3.) Grinders, with broad angular tops, for comminuting or grinding the food. They are situated, as in the human subject, on each side the jaws. The teeth afford a principal character in forming the tribes and genera; or particular sets of quadrupeds: for in some, the canine teeth are wanting; in others, the front teeth; and some few are totally destitute of any teeth. The tail, in quadrupeds, is formed by a continuation of the vertebræ or joints of the back-bone; and is in some of great length, and covered with very long hair; in others very short; and in some few entirely wanting, as in the real or genuine apes.

The senses of the mammalia consist, as in *man*, of the organs of sight, hearing, tasting, and smelling, and the power of feeling; and, in many of these animals, the organs are of greater acuteness or sensibility than in man. The eyes, in some quadrupeds, are furnished with what is called a *nictitating* membrane, or semi-transparent guard; situated between the eyelids; and which can, at pleasure, be drawn over the ball of the eye for additional defence. The nose, or organ of smelling, is more or less compressed and lengthened. In the *elephant*, it is extended in a most wonderful manner into a long and tubular proboscis, or trunk, at the top of which are placed the nostrils. The tongue is usually of a flattened and lengthened shape; sometimes, as in the *cat* or *lion* tribe, beset on its upper surface with small reversed spines. In some few, as in the *ant-eater*, it is of a cylindric shape, and lengthened into the form of a worm, and can be extended at the pleasure of the animal. The teats, or mammæ, are found in all these animals, and, as before observed, gave rise to the Linnæan title of the whole class. The mammalia are divided into the seven following orders:—*primates*, *bruta*, *feræ*, *glîres*, *pecora*, *belluæ*, and *cetæ*.

ORDER I. PRIMATES. This is so entitled, as containing the chiefs of the creation. Its characters are, four front or cutting teeth above and below; and one canine or sharpened tooth on each side these. The feet are formed with a resemblance of hands, and the nails are more or less oval in shape. Most of the orders feed chiefly on vegetable substances. To this order belong the following genera:—1. *Simia*, oran-otan, apes, monkeys, baboons. 2. *Lemur*, macauro. 3. *Vespertilio*, bat.

ORDER II. BRUTA is characterized by a want of front or cutting teeth, both in the upper and lower jaw. The feet are armed with strong claws: the pace is, in general, somewhat slow, and their food is principally vegetable. The genera are, 1. *Bradypus*, sloth. 2. *Dasypus*, armadillo. 3. *Manis*, pangolin. 4. *Myrmecophaga*, ant-eater. 5. *Platypus*, ornithorhynchus, or duckbill. All the animals belonging to these genera are totally destitute of front teeth, and some are destitute of all teeth. The *platypus* exhibits the bill of a duck engrafted upon the head of a quadruped. The whole animal is thickly covered with strong, but soft and glossy, hair, and has four webbed feet furnished with sharp claws. This dubious quadruped is a native of Australasia, or New Holland, and is supposed to feed on worms, water-insects, and weeds. It is obliged to rise every now and then to the surface in order to breathe, and at this juncture it is principally taken, by transfixing it with a small harpoon.

ORDER III. FERÆ contains the predacious quadrupeds or animals of prey, and consists of several genera, all agreeing in having teeth evidently calculated for feeding on flesh. The front teeth, which are usually six both above and below, approach to a conic or pointed figure; the canine teeth are long; and the grinders not flattened at the top, but are of a sharpened form: the claws also, with which the feet are furnished, are sharp, and more or less curved in

the different species. The genera are, 1. *Canis*, dog, wolf, hyæna, fox *, and jackal. 2. *Felis*, cat †, lion, tiger, leopard, lynx, panther, &c. 3. *Viverra*, weasel, ferret, polecat, civet. 4. *Ursus*, bear. 5. *Didelphis*, opossum. 6. *Macropus*, kangaroo. 7. *Talpa*, mole. 8. *Sorex*, shrew. 9. *Erinaceus*, hedgehog.

Those terrible enemies of mankind, the *tiger* and the *bear*, are thus characterized by the poets :—

As a *tiger*, who by chance hath spied
In some purlieu two gentle fawns at play,
Strait couches close, then rising changes oft
His couchant watch, as one who chose his ground,
Whence rushing he might surest seize them both
Gripped in each paw.

MILTON.

There thro' the piny forest half absorpt,
Rough tenant of these shades, the shapeless *bear*,
With dangling ice all horrid, stalks forlorn ;
Slow-paced, and sourer as the storms increase,
He makes his bed beneath th' inclement drift,
And, with stern patience, scorning weak complaint,
Hardens his heart again assailing want.

THOMSON.

ORDER IV. GLIRES or sleepers, from the Latin word *glis*, signifying an animal of the dormouse tribe. The principal character of the animals composing

* In clear warm weather, the fox sometimes comes to bask in the sunshine, lying stretched out on some dry place, or near the stump of a tree. He is in motion, the whole night, in search of his prey :—

Stealing around and list'ning as he goes,
If chance the cock or stamm'ring capon crows,
Or goose, or nodding duck, should darkling cry,
As if apprized of lurking danger nigh.

† *Grimalkin* to domestic vermin sworn
An everlasting foe, with watchful eye
Lies nightly brooding o'er a chinky gap,
Protending her fell claws, to thoughtless mice
Sure ruin.

PHILIPS.

this order, consists in a pair of very conspicuous, strong, and lengthened teeth, placed close together in the front of both jaws. They have no canine teeth, but are furnished with grinders on each side. The genera are, 1. *Hystrix*, porcupine. 2. *Castor*, beaver. 3. *Mus*, mouse and rat. 4. *Cavia*, guinea-pig. 5. *Arctomys*, marmot. 6. *Lepus*, hare*. 7. *Sciurus*, squirrel. 8. *Myomys*, dormouse. 9. *Dipus*, jerboa. 10. *Hyrax*, Cape and Syrian rabbit.

Armed at all points, in Nature's guardian mail,
See the stout *Porcupine* his foes assail ;
And urged to fight, the ready weapons throw,
Himself at once the quiver, dart, and bow.

Marmots live in societies from five to fourteen in number, in burrows which have several passages constructed with great art. They inhabit the Alps and Pyrenean mountains, and remain in a torpid state from the end of September to the beginning of April. A boiled marmot is not an uncommon dish in Switzerland. Some of the peculiar habits of the marmot are well described in the following lines :

Who taught the *Marmot* softly to bestrew
His winter-cell with downy leaves, with wool
Left on the bush by rambling flocks, and plumes
Dropt from the breast of moulting pelicans ;
And, provident, to hoard the prickly nuts
Of tempest-beaten trees ; there long to sleep
Or muse in gentle slumbers, while the blast
And pelting storm, in raging mood, resound
And shake the rocky piles from their high tops
Down to the frightened vales below ?

z.

ORDER V. PECORA. The leading character in

* She runs,
She flies, and leaps, and bounces to deceive
The scent-inhaling foes, who urge the chase
And toil to catch a booty not their own.
The dales, the lawns, she crosses back in vain,
Till fainting—breathless—spent—at last she drops
On some fresh verdant turf or thymy bank,
Once the fair scene of her nocturnal sports.

z.

this order, is the total want of front teeth in the *upper* jaw. In the lower jaw, there are six or eight front teeth: the grinders, or side teeth, are usually pretty numerous, and such of the pecora as are furnished with horns have no tusks or canine teeth; which, on the contrary, are conspicuous in such as are not furnished with horns. The pecora have the power of *rumination*; that is, of throwing up, into the mouth, at intervals, a portion of the food which has been hastily swallowed, during their feeding, in order that it may undergo a more complete grinding by the teeth. This action is so conspicuous in cows, and other cattle, that every one is perfectly acquainted with it. All the pecora, or ruminants as they are often called, are *hoofed*; and in the major part, the hoof is divided into two principal parts, with the addition, in many, of two very small undivided hoofs or processes on each side, or rather behind the principal ones. In the *camel*, the sole, or part beneath the hoofs, is swelled into a kind of elastic pad, covered with an extremely strong but flexible skin, admirably adapted for enabling the animal to travel over the dry and sandy deserts, which it is chiefly destined to inhabit. The whole order pecora, without an exception, feeds entirely on vegetable food. The genera are:—1. *Elephas*, elephant. 2. *Camelus*, camel, dromedary, lama, vicuna. 3. *Giraffa*, giraffe or camelopard. 4. *Cervus*, elk, deer-kind*.

* If a person, at some distance, whistle or call aloud; the *stag* immediately stops short in his slow-measured pace, and gazes on the intruder with a kind of awkward admiration; but, if the sagacious animal perceive neither dogs, nor any instruments of destruction levelled against him, he then proceeds forward without betraying the least fear. WALTER SCOTT's description of these various motions is truly picturesque: at the sound of the clanging hoof and horn—

The antlered monarch of the waste
Sprung from his heathery couch in haste;
But, ere his fleet career he took,
The dew-drops from his flanks he shook;

5. *Bos*, ox, buffalo. 6. *Moschus*, musk. 7. *Antelope*, antelope, chamois. 8. *Ovis*, sheep. 9. *Capra*, goat.

Peaceful, beneath primeval trees that cast
 Their ample shade o'er Niger's yellow stream,
 And where the Ganges rolls his sacred wave,
 Or mid the central depth of blackening woods,
 High raised in solemn theatre around,
Leans the HUGE ELEPHANT.

THOMSON.

The *giraffe* is by far the tallest of all known quadrupeds, measuring the extraordinary height of *seventeen feet three inches*, from the hoof of the fore foot to the top of the head, while the body scarcely exceeds that of a horse. It is of a pale, yellowish, or whitish brown, with numerous spots of a chestnut colour, and its whole aspect is at once simple and elegant. It is a harmless, timid animal, living in small herds of six or seven together, in the plains that border on Caffraria, in the vicinity of the Cape. The giraffes are so exceedingly shy, that it is with the greatest difficulty they can be approached: they feed on the fruit of the wild apricot, and on the tender branches of the several species of the *mimosa*, or sensitive plant. The only two specimens in England are preserved in the Museum of the College of Surgeons, and in the interesting collection of *Mr. Bullock* in Piccadilly.

ORDER VI. *BELLUE* consists, in general, of animals either of large or moderate size, of an unshapely form, and having a tough and thick hide. It com-

Like crested leader, proud and high,
 Tossed his beamed frontlet to the sky;
 A moment gazed adown the dale,
 A moment snuffed the tainted gale,
 A moment listened to the cry,
 That thickened as the chase drew nigh;
 Then, as the headmost foes appeared,
 With one brave bound the oopse he cleared.

prizes the following genera. 1. *Equus*, horse, ass*, zebra. 2. *Rhinoceros*. 3. *Hippopotamus*. 4. *Tapir*. 5. *Sus*, pig-kind, pecari, babiroussa.

The ardour of the HORSE has been well described by SHAKESPEARE, in one of the finest passages of old English poetry. It is taken from a beautiful, but neglected, poem of this great man.

Imperiously he leaps, he neighs, he bounds,
And now his woven girths he breaks asunder;
The bearing earth with his hard hoof he wounds,
Whose hollow womb resounds like heaven's thunder:
The iron bit he crushes 'tween his teeth,
Controlling what he was controlled with.

His ears up-pricked, his braided hanging mane,
Upon his compassed crest now stands on end;
His nostrils drink the air, and forth again,
As from a furnace, vapours doth he lend:
His eye, which glisters scornfully like fire,
Shows his hot courage, and his high desire.

Sometimes he trots, as if he told the steps,
With gentle majesty, and modest pride:
Anon he rears upright, curvets and leaps,
As who should say, Lo! thus my strength is tried;
And thus I do to captivate the eye
Of the fair breeder that is standing by.

What recketh he his rider's angry stir,
His flatt'ring holla, or his stand, I say?
What cares he now for curb, or pricking spur?
For rich caparisons, or trappings gay?
He sees his love, and nothing else he sees,
For nothing else with his proud sight agrees.

The *pinnated mammalia* are those in which the

* 'Tis an animal (observes the benevolent Sterne). I cannot bear to strike—there is a patient endurance of sufferings, wrote so unaffectedly in his looks and carriage, which pleads so mightily for him, that it always disarms me; and to that degree, that I do not like to speak unkindly to him; on the contrary, meet him where I will, whether in town or country, in cart or under panniers—whether in liberty or bondage—I have ever something civil to say to him; and surely never is my imagination so busy as in framing his responses from the etchings of his countenance.

divisions or toes of the feet are connected by webs ; enabling the animals, whose principal residence is in the waters, to *swim* with far greater facility than any other quadrupeds ; while, on the contrary, they *walk* with much greater difficulty. There are two genera. 1. *Phoca*, seals. 2. *Trichecus*, morse or walrus, manati or sea-cow.

In Cornwall, when persons are in pursuit of the seal, it is said to be a common practice, as soon as the animal is observed to thrust its head above water, to halloo to it, till they can approach within gun-shot, since it will continue to listen to the sound for many seconds.

The seal, indeed, displays a taste for music, which could scarcely be expected from his habits and local predilections. They will long follow a boat in which any musical instrument is played, and even a tune simply whistled has attractions for them. The Dean of the Isles says of Heiskar, a small uninhabited rock, about twelve (Scottish) miles from the isle of Uist, that an infinite slaughter of seals takes place there. To this circumstance Mr. WALTER SCOTT has prettily alluded, in his poem of ‘ *The Lord of the Isles* :’—

In Lettermore, the timid deer
Will pause, the harp’s wild chime to hear;
Rude Heiskar’s *seal*, through surges dark,
Will long pursue the minstrel’s bark ;
To list his notes, the *eagle* proud
Will poise him on Ben Cailliach’s cloud.

ORDER VII. CETE, or CETACEA, comprises the cetaceous mammalia, or whale tribe. These cannot, in strict propriety, be called quadrupeds, since they are only furnished with two feet, which have the appearance of thick fins, while the tail is merely muscular and tendinous. But, since the whole interior structure agrees with that of the mammalia ;—since they have lungs and breathe,—since they have warm blood, and a heart resembling in conformation that of quadru-

peds,—and, in particular, since they produce and nourish their young in the same manner,—it follows very clearly, that they can with propriety be ranked in no other class of animals than the Linnæan mammalia. The genera are, 1. *Balæna*, proper whales. 2. *Physeter*, spermaceti whales*. 3. *Delphinus*, dolphin, porpoise, grampus. 4. *Monodon*, narwhal, sea-unicorn.

The author of the '*Shipwreck*' thus beautifully describes the death of the *dolphin*, after it has been struck by the harpooners:—

On deck he struggles with convulsive pain ;
 But while his heart the fatal javelin thrills,
 And fleeting life escapes in sanguine rills,
 What radiant changes strike th' astonished sight,
 What glowing hues of mingled shade and light !
 No equal beauties gild the lucid West
 With parting beams all o'er profusely drest ;
 No lovelier colours paint the vernal dawn
 When orient dews impearl th' enamelled lawn ;
 Than from his sides in bright suffusion flow,
 That now with gold empyreal seem to glow.
 Now in pellucid sapphires meet the view,
 And emulate the soft celestial hue ;
 Now beam a flaming crimson to the eye,
 And now assume the purple's deeper dye ;
 But here description clouds each shining ray ;
 What terms of art can Nature's power display ?

FALCONER.

Having now taken a short, but comprehensive, survey of the various Classes, Orders, and Genera of the Animal Kingdom, we add some reflections on the

* The *aorta*, or principal artery, in that stupendous animal the *whale*, measures above a foot in diameter ; and it is computed that the quantity of blood thrown into it, at every pulsation of the heart, is not less than from *ten to fifteen gallons*.

Leviathan,

Hugest of living creatures, on the deep,
 Stretched like a promontory, sleeps or swims,
 And seems a moving land, and at his gills
 Draws in, and at his trunk spouts out, a sea.

MILTON.

‘ Beauties of Nature,’ as an appropriate close to this INTRODUCTION*.

The beauties of nature are open to *all*, and may be relished and enjoyed by *all*. A *taste* for them is highly desirable, and we should cherish it as the source of real pleasure. The scenes of nature (as it is observed by a good writer) contribute powerfully to inspire that serenity which heightens their beauties, and is necessary to our full enjoyment of them. By a secret sympathy, the soul catches the harmony which she contemplates ; and the frame within assimilates itself to that without. In this state of sweet composure we become susceptible of virtuous impressions from almost every surrounding object. The patient *ox* is viewed with generous complacency ; the guileless *sheep* with pity ; and the playful *lamb* with emotions of tenderness and love. We rejoice with the *horse* in his liberty and exemption from toil, while he ranges at large through enamelled pastures. We are charmed with the songs of *birds*, soothed with the buzz of *insects*, and pleased with the sportive motions of *fishes*, because these are expressions of enjoyment ; and, having felt a common interest in the gratifications of inferior beings, we shall be no longer indifferent to their sufferings, or become wantonly instrumental in producing them.

But the taste for natural beauty is subservient to higher purposes than those which have been enumerated. The cultivation of it not only refines and humanizes, but dignifies and exalts the affections.

* In writing this Introduction, we have to acknowledge the assistance we have received from Dr. SHAW's ‘ *Zoological Lectures*,’ the Rev. Mr. Bingley's ‘ *Animal Biography*,’ and Mr. M'Quin's ‘ *Description of Three Hundred Animals*.’ The ‘ *Zoological Lectures*’ deserve to be generally read, and form an admirable introduction to the larger work, entitled ‘ *GENERAL ZOOLOGY*,’ which is unequalled for the elaborate fidelity of its descriptions, and the beauty and accuracy of the plates with which it is embellished.

It elevates them to the admiration and love of that Being, who is the author of all that is fair, sublime, or good in the creation. Scepticism and irreligion are hardly compatible with the sensibility of heart which arises from a just and lively relish of the wisdom, harmony, and order subsisting in the world around us. Emotions of piety must spring up spontaneously in the bosom that is in unison with all animated nature. Actuated by this beneficial and divine inspiration, man finds a fane in every grove; and, glowing with devout fervour, he joins his song to the universal chorus, or muses the praise of the Almighty in more expressive silence!—Of such a man it may be said with the poet, that

He suits to *Nature's* reign th' inquiring eye,
 Skilled all her soft gradations to descry;
 From *Matter's* mode through *Instinct's* narrow sway,
 To *REASON's* gradual but unbounded way,
 And sees through all the wonder-varied chain
 No link omitted, no appendage vain,
 But all supporting, and supported till
 The whole is perfect as the *AUTHOR'S* will.

Hence even the meanest points of *Nature's* care
 Fix his attention—his attachment share:
 The *pebble*, through pellucid waters shown,
 The *moss* that clothes—the *shrub* that cleaves to stone,
 The modest-tinted *flowers* that deck the glade,
 The aged *tree* that spreads its awful shade,
 The *feathered* race that wing th' ethereal way,
 The *insect* tribes that float upon the ray,
 The *herd* that graze, the *flocks* that nip the plain,
 And *scaly* natives of the watery reign.

These hold ten thousand wonders to the sight,
 Which prompt *inquiry* and inspire *delight*;
 Relations—properties—proportions—ends—
 Burst into light as her research extends;
 Until unnumbered sparks around him fall
 From the Great Source of *Light*, and *Life*, and *ALL*!

DR. L. BROWN.

At one wide view God's eye surveys
His works, in every distant clime;
He shifts the seasons, months, and days,
The short-lived offspring of revolving time ;
By turns they die, by turns are born.
Now cheerful SPRING the circle leads,
And strows with flowers the smiling meads;
Gay SUMMER next, whom russet robes adorn,
And waving fields of yellow corn;
Then AUTUMN, who with lavish stores the lap of nature spreads ;
Decrepit WINTER, laggard in the dance,
(Like feeble age oppressed with pain)
A heavy season does maintain,
With driving snows, and winds and rain ;
Till SPRING, recruited to advance,
The various year rolls round again.

HUGHES.

TIME'S TELESCOPE

FOR

1817.

JANUARY.

THE name given to this month by the Romans was taken from *Janus*, one of their divinities, to whom they gave two faces; because on the one side, the first day of this month looked towards the new year, and on the other towards the old one. It was called *wolf-monat* by our Saxon ancestors, on account of the danger they then experienced from wolves.

Remarkable Days.

I.—CIRCUMCISION.

ON this day is celebrated the Circumcision of our Saviour, a rite of the Jewish law, first enjoined to Abraham as a token of the covenant God made with him and his posterity.

Hark! the merry bells ring round
With clamorous joy to welcome in this day,
This consecrated day
To mirth and indolence.

The antient custom of going about with the *wassail*, 'a bowl of spiced ale,' is yet retained in many places. The composition was ale, nutmeg, sugar, toast, and roasted crabs or apples, and was called *lamb's wool*. The ceremonies observed on New Year's Day, in France, are described at length in T. T. for 1815, p. 2.

6.—EPIPHANY.

On the *Epiphany* or *manifestation* of Christ to the Gentiles, commonly called *Twelfth-day*, the Eastern magi were guided by the star to pay homage to their Saviour; and it takes its name from their coming on that day, which was the twelfth after the nativity. The usual celebration of *Twelfth-day*, in the metropolis and in the south of England, is by drawing lots, and assuming fictitious characters for the evening:—formerly the king or queen was chosen by a bean found in a piece of divided cake; and this was once a common Christmas gambol in both the English Universities. The day after *Twelfth-day* was called *St. Distaft's-day*. The customs in France, and at Rome, on this day, are noticed in *T. T.* for 1815, p. 6.

8.—SAINT LUCIAN.

Saint Lucian, confessor and martyr, was born at Samosata in Syria. He was well versed in the Hebrew language, and employed much time in comparing and amending the copies of the Bible. Lucian was put to death by Maximinus II.

*9. 1806.—FUNERAL OF NELSON.

Saw ye the streets when NELSON died,
When his funereal train drew near,
The troops arranged on ev'ry side,
The people gazing in the rear?

I saw the streets when NELSON died:
When his funereal car drew near,
Not one brave heart but deeply sighed,
Not one fair cheek without a tear.

A nation's grief bedewed his grave;
Devotion mourned him as her own;
For, in the battle truly brave,
He feared th' OMNIPOTENT alone!

O! how it soothed the Hero's shade,
Though weeping still at Trafalgar,
When in the grave his dust was laid
With all the pride and pomp of war!

J. MAYNE.

*10. 1778.—LINNÆUS DIED.

Ten years after the death of this great man, a new society of Naturalists, distinguished by his name, was founded in London, and has since been incorporated by Royal Charter. This appellation was chosen also on account of the Museum of Linnæus having fallen into the hands of Sir James Smith, its original projector, and hitherto only president. This treasure comprehending the library, herbarium, insects, shells, and all other natural curiosities, with all the MSS. and whole correspondence of the illustrious Swede, were obtained by private purchase from his widow, after the death of his son, in 1783. The *Linnean Society* have published several volumes of most valuable 'Transactions.'

13.—PLOUGH MONDAY.

On this day, or about this time, in the north, the *fool-plough* goes about, a pageant that consists of a number of sword-dancers, dragging a plough, with music, and one, sometimes two, in a very fantastic dress; the *Bessy*, in the grotesque habit of an old woman, and the *fool*, almost covered with skins, wearing a hairy cap, and the tail of some animal hanging from his back.

13.—SAINT HILARY.

Hilary was born at Poitiers in France, of an illustrious family; and of this place he was chosen bishop in the year 353. He died at Poitiers in 368. Hilary was an excellent orator and poet; his style abounds with rhetorical figures.

*13. 1790.—MONASTERIES SUPPRESSED IN FRANCE.

*14. 640.—ALEXANDRIAN LIBRARY BURNED.

This noble library, containing more than seven hundred thousand volumes, was utterly destroyed by the order of the calif Omar, when he acquired possession of Alexandria. The volumes of paper, or parchment, were distributed to the four thousand baths of

the city; and six months were barely sufficient for the consumption of this precious fuel.

*16. 1794.—GIBBON DIED.

It was on the day, or rather night, of the 27th. of June, 1787, between the hours of eleven and twelve, that I wrote the last lines of the last page^a in a summer-house in my garden. After laying down my pen, I took several turns in a *berceau*, or covered walk of acacias, which commands a prospect of the country, the lake, and the mountains. The air was temperate, the sky was serene, the silver orb of the moon was reflected from the waters, and all nature was silent.

I will not dissemble the first emotions of joy on the recovery of my freedom, and, perhaps, the establishment of my fame. But my pride was soon humbled, and a sober melancholy was spread over my mind by the idea that I had taken an everlasting leave of an old and agreeable companion, and that, whatsoever might be the future date of my History, the life of the historian might be short and precarious. I will add two facts which have seldom occurred in the composition of six, or, at least, five quarto volumes: 1. My rough MS., without any intermediate copy, has been sent to press. 2. Not a sheet has been seen by any human eyes, excepting those of the author and of the printer; the faults and merits are exclusively my own.—*Gibbon's Common Place Book.*

*16. 1780.—SIR J. H. MOORE DIED.

If in the web of life entwined
Some mingled threads of love we find,
O let unskilful hands forbear,
Lest with rude touch the work they tear,
And wound some kindred virtue there!

*17. 1792.—BISHOP HORNE DIED.

This great man thus beautifully characterises the Psalms of David: 'They present (says he) religion to us in the most engaging dress; communicating

^a Of the Decline and Fall of the Roman Empire.

truths which philosophy could never investigate, in a style which poetry can never equal ; while history is made the vehicle of prophecy, and creation lends all its charms to paint the glories of redemption. Calculated alike to profit and to please, they inform the understanding, elevate the affections, and entertain the imagination. Indited under the influence of HIM, to whom all hearts are known, and all events fore-known, they suit mankind in all situations, grateful as the manna which descended from above, and conformed itself to every palate. The fairest productions of human wit, after a few perusals, like gathered flowers, wither in our hands, and lose their fragranc y ; but these unfading plants of paradise become, as we are accustomed to them, still more and more beautiful ; their bloom appears to be daily heightened ; fresh odours are emitted and new sweets extracted from them. He who hath once tasted their excellencies, will desire to taste them yet again ; and he who tastes them oftenest, will relish them best.'

18.—SAINT PRISCA.

Prisca, a Roman lady, was early converted to Christianity ; but refusing to abjure her religion, and to offer sacrifice when she was commanded, was horribly tortured, and afterwards beheaded, under the Emperor Claudius, in the year 275.

*20. 1779.—GARRICK DIED.

*20. 1790.—HOWARD DIED.

He visited all Europe, not to survey the sumptuousness of palaces, or the stateliness of temples ; not to make accurate measurements of the remains of antient grandeur, nor to form a scale of the curiosity of modern art ; not to collect medals, or collate manuscripts ;—but to dive into the depths of dungeons ; to plunge into the infection of hospitals ; to survey the mansions of sorrow and pain ; to take the gage and dimensions of misery, depression, and contempt ; to remember the forgotten, to attend to the neglected,

to visit the forsaken, and to compare and collate the distresses of men in all countries.—*Burke.*

*20. 1813.—WIELAND, GERMAN POET, DIED.

21.—SAINT AGNES.

Agnes, a young Roman lady, of a noble family, suffered martyrdom in the tenth general persecution, under the Emperor Dioclesian, in the year 306. Although the executioners wounded her most cruelly with the sword, yet she bore it with incredible constancy, singing hymns all the time : she was then no more than thirteen or fourteen years of age.

*21. 1793.—LOUIS XVI BEHEADED.

The 21st of the month was peculiarly fatal to Louis. June 21, 1770, at a *fête* given in consequence of his marriage, a vast number of persons were trampled to death ; June 21, 1792, he escaped from Paris to Varennes ; and on September 21, 1792, royalty was abolished in France.

*22. 1788.—LORD BYRON BORN.

Ah ! since thy angel form is gone,
My heart no more can rest with any ;
But what it sought in thee alone,
Attempts, alas ! to find in many.

Yes, once the rural scene was sweet,
For Nature seemed to smile before thee ;
And once my breast abhorred deceit,
For then it beat but to adore thee :

But, now, I seek for other joys ;
To think, would drive my soul to madness :
In thoughtless throngs, and empty noise,
I conquer half my bosom's sadness.

Yet, e'en in these, a thought will steal
In spite of ev'ry vain endeavour ;
And fiends might pity what I feel,
To know that thou art lost for ever¹.

22.—SAINT VINCENT.

Vincent, a deacon of the church in Spain, suffered

¹ From lines 'To ———' in 'Hours of Idleness,' by Lord Byron.

martyrdom in the Dioclesian persecution, about the year 303, being extended upon burning coals; and, after his body was broiled there, he was thrown upon heaps of broken tiles.

***23. 1792.—SIR JOSHUA REYNOLDS DIED.**

Study Sir Joshua's Works, young men;—
Not pictures only, but his pen :
Who, when Cimmerian darkness whelmed our isle,
Appeared a comet in his art;—
Bid Nature from the canvas start,
And with the Graces bade that canvas smile.
Could Titian from his tomb arise,
And cast on Reynolds' art his eyes,
How would he heave of jealousy, the groan !
Here possibly I may mistake ;
As Titian probably might take
The works of our great master for his own.

DR. WOLCOTT.

***23. 1806.—WILLIAM PITT DIED.**

Drop upon Fox's grave the tear,
'Twill trickle to his rival's bier ;
O'er PITT's the mournful requiem sound,
And Fox's shall the notes rebound.
The solemn echo seems to cry,—
' Here let their discord with them die ;
' Speak not for those a separate doom,
' Whom fate made brothers in the tomb ;
' But search the land of living men,
' Where wilt thou find their like agen ?

WALTER SCOTT.

***24. 1679.—LONG PARLIAMENT DISSOLVED.**

25.—CONVERSION OF SAINT PAUL.

This day celebrates the miraculous conversion of St. Paul. He was beheaded under the general persecution of Nero; hence the usual representation of him with a sword in his hand.

***28. 1547.—EDWARD VI BEGAN TO REIGN.**

He was counted the wonder of his time; he was not only learned in the tongues and the liberal sciences, but he knew well the state of his kingdom. He kept a table-book, in which he had written the cha-

racters of all the eminent men of the nation : he studied fortification, and understood the mint well. He knew the harbours in all his dominions, with the depth of the water, and way of coming into them. He understood foreign affairs so well, that the ambassadors who were sent into England published very extraordinary things of him in all the courts of Europe.

Edward had great quickness of apprehension ; but, being distrustful of his memory, he took notes of every thing he heard (that was considerable) in *Greek characters*, that those about him might not understand what he writ, which he afterwards copied out fair in the journal that he kept. His virtues were wonderful : when he was made to believe that his uncle was guilty of conspiring the death of the other counsellors, he upon that abandoned him. He was very merciful in his nature, which appeared in his unwillingness to sign the warrant for burning the maid of Kent.

He took care to have his debts well paid, reckoning that a prince who breaks his faith, and loses his credit, has thrown up that which he can never recover, and made himself liable to perpetual distrust and extreme contempt. He took special care of the petitions that were given him by poor and oppressed people. But his great zeal for religion crowned all the rest—it was not an angry heat about it that actuated him, but it was a true tenderness of conscience, founded on the love of God and his neighbour. These extraordinary qualities, set off with great sweetness and affability, made him universally beloved by his people. Edward expired at Greenwich, in the *sixteenth* year of his age and the *seventh* of his reign.—*Burnet*.

*28. 1596.—SIR FRANCIS DRAKE DIED.

30.—KING CHARLES I, MARTYR.

King Charles I was beheaded on this day. Some interesting particulars of his execution, and of the

finding of his body, are detailed in T. T. for 1815, p. 16, and in our last volume, pp. 6—10.

A brutal and unmanly insult to the memory of this martyred sovereign was offered by the adherents of Cromwell in the institution of the CALVES' HEAD CLUB, the orgies of which were celebrated so late as the year 1735.

*30. 1641.—CHILLINGWORTH DIED.

Astronomical Occurrences

In JANUARY 1817.

Obliquity of the Ecliptic.

WE have already explained (See T. T. for 1816, p. 16) the method by which this great circle of the heavens, denominated the *Ecliptic*, was first ascertained; and we shall make such further remarks on the subject, in our observations for next month, as are requisite to give the young astronomical student a clear view of its inclination to the equator, and the variations to which this inclination is subject. The following table shows the obliquity for various epochs during the present year.

Obliquity of the Ecliptic for 1817.

TABLE.

January	1st, the obliquity is	:	:	:	23° 27' 51".9
April	1st,	.	.	.	23 27 53 .3
July	1st,	.	.	.	23 27 53 .2
October	1st,	.	.	.	23 27 54 .4
December	31st,	.	.	.	23 27 54 .2

Having explained the meaning and application of the *Equation of Time* in our former volumes (see T. T. for 1814, p. 60; and for 1816, p. 19), we shall only observe here, that the following table shews what is to be added to *apparent* time in order to obtain *mean* time, on every fifth day of the present month.

TABLE.

Wednesday	1st, to the time on the dial	add	m. s.
Monday	6th,		3 56
Saturday	11th,		6 19
Thursday	16th,		8 19
Tuesday	21st,		10 10
Sunday	26th,		11 44
Friday	31st,		12 58

The Sun enters the sign Aquarius at 56 m. past 7 in the morning of the 20th of January; and the following table shews the time of his rising and setting for every fifth day of the month. The time for any intermediate day must be found by proportion, in the same manner as in the example for the equation of time in the *Astronomical Occurrences* for next month.

TABLE

Of the Rising and Setting of the Sun for every fifth Day.

January 1, Sun rises	5 m. after 8.	Sets	55 m. after 3
6,	1	8	59 3
11,	56	7	4 4
16,	51	7	9 4
21,	44	7	16 4
26,	37	7	23 4
31,	29	7	31 4

The Moon will be full at 44 m. past 12 o'clock on the 3d of January; she will enter her last quarter at 42 m. after 11 of the morning on the 10th; the change or New Moon will take place at 38 m. after 12 on the 17th; and her first quarter will commence at 43 m. past 11 o'clock in the morning of the 25th of the month. The Moon may be seen on the first meridian of this country on the following days of this month, at a convenient time for observation, viz.

1st day, at	36 m. after 10	at night.
2d	31	11
26th	38	6 in the evening.
27th	25	7
28th	15	8
29th	8	9
30th	5	10
31st	3	11

At 4 m. past 3 o'clock in the morning of the 12th the Moon will be in conjunction with the star marked α in the sign Libra; at 8 m. after 10 in the morning of the 13th the Moon and the star marked β in Scorpio will also be in conjunction. At 4 m. after 2 in the afternoon of the 13th the Moon and Jupiter will be in conjunction; and at 17 m. past 8 on the morning of the 14th she will be in conjunction with the Georgium Sidus; and, at 28 m. past midnight of the same day, with Mars. The conjunctions above stated are such as will appear at the *Royal Observatory*, at the respective times, if the weather be favourable.

Mercury will be at its greatest *elongation* on the 24th of the month. There will be only one eclipse of Jupiter's first satellite visible this month in the neighbourhood of London, and this will happen on the 21st, when the immersion will take place at 41 m. past 5 in the morning. There will also be one eclipse of Jupiter's second satellite on the 25th; and the immersion will take place at 39 m. after 6 o'clock in the morning.

On the Importance and Utility of Astronomy.

BEFORE we can form an accurate judgment of any science, it is necessary to have some acquaintance with its nature, principles, and design; and such knowledge we trust our former volumes are calculated to convey on the subject of ASTRONOMY.

In the Introduction to the volume of T. T. for 1815, we briefly adverted to the *dignity* of astronomy; and as our readers are now better prepared to comprehend our observations and appreciate our labours, we shall avail ourselves of the present opportunity to offer a few remarks on the *importance* and *utility* of this sublime science: in the performance of which it is not our intention to amuse the inquisitive by soaring into the regions of fruitless spe-

ulation, but to bring the subject home to the 'business and bosoms' of our readers.

On viewing the results of astronomy in connection with the *common affairs* of life, numerous examples of their practical utility immediately present themselves. A knowledge of the seasons is indispensable to the proper cultivation of the earth; as it not only guides the labours of the husbandman, but regulates his expectations, excites his hopes, and allays his fears. But this knowledge can only be obtained by searching in the heavens for those invariable signs with which the seasons are so closely connected, and which always announce their return. Custom, however, now supplies the place of observation, and the exertions of the learned have, in this respect, greatly diminished the vigilance of the laborious members of society; but if we retrace the steps by which astronomy has attained its present perfection, until we arrive at those ages when the tiller of the ground was not only dependent upon himself for executing the labours of the field, but for ascertaining the proper time for their performance, we shall immediately perceive the advantages which the cultivation of the earth has received from the science of the heavens.

The rising of the dog star at the same time as the Sun announced to the Egyptians the overflowing of the Nile, upon which their seed-time, and consequently their harvest, depended; and thus also Arcturus, Orion, and the Pleiades, pointed out the seasons to the Greeks. Ancient poets and historians also furnish numerous examples from which we may learn that several of the most polished nations of antiquity had no other calendars than the records of a few similar observations on the risings and settings of some particular stars. The rudiments of astronomy and the labours of husbandry then went hand in hand, and which is still the case with those people who have emerged

from barbarism, but have not yet reached the confines of civilization.

Nothing is more essential in transacting the common affairs of life, or conducive to the well-being of society, than an easy and accurate measure of *time*; but as our ideas of duration include those of motion, it is necessary that this motion should be constant and uniform, in order that its subdivisions may possess the requisite accuracy. The globe we inhabit, however, does not afford any motion adequate to this purpose; and it is among the heavenly bodies alone that such an invariable standard can be found. The motions of these have furnished us with a knowledge of the seasons; and they also supply us with an accurate measure of the smaller intervals. The untutored savage computes his time by the falls of snow or the progress of vegetation; the more advanced in the arts and knowledge of life employs moons or months as the units of his reckoning; while those who have made a still greater progress in civilization, add years and days, with their subdivisions, to their scale of time. But that these last may harmonize with each other, as well as each be of individual utility, an application of the principles of astronomy is necessary for their regulation. Hence arose the calendar, by which our civil affairs, at least as far as they depend upon the divisions of time, are conducted: and thus it is that the movements of the celestial bodies, by a kind of imperceptible connexion, regulate the actions and affairs of men.

Chronology is another subject which has derived the most signal advantages from the science of astronomy. Those who have carried their researches into the annals of ancient nations, and endeavoured to investigate the events and transactions of past ages, are sensible of the uncertainty and obscurity that hover around them at every step. They find the narration of few facts accompanied by precise dates, and these are seldom the same in different authors.

But even here the torch of astronomical science illumines the perplexing labyrinth, and shows some points in the regions over which darkness had brooded for so many ages, and presents, as it were, the refreshment of repose to the weary and bewildered mind, until it is conducted to a degree of certainty unattainable without its aid. And it deserves to be remarked, that here even ignorance and superstition are, by the powerful influence of astronomy, rendered subservient to science and truth; as it is from the records which the ancients have left of the eclipses, which were then equally the terror of individuals and of nations, that we are enabled to determine the precise time at which they took place. It was by means of his astronomical knowledge that the celebrated Dr. Halley determined the very day and hour on which Julius Cæsar landed in Great Britain; and it has lately been shown by F. Baily, Esq. (see the Philosophical Transactions), that the great solar eclipse which terminated the six years' war between the Medes and the Lydians, as mentioned by Herodotus, happened on the 30th of September, six hundred and ten years before the christian era. Hence, if the date of some memorable event mentioned by the historian were entirely lost, but the relation of the fact accompanied by an account of some remarkable eclipse, the astronomer, by his knowledge of the celestial motions, would easily determine the precise time at which it happened.

These advantages, however, are not merely confined to the subjects we have enumerated: *Navigation* and *Geography*, as sciences, owe their very existence to astronomy. Navigation existed as an art long before it had any claim to the title of a science; and during these ages the mariner coasted along the shore, or confined himself to the crossing of narrow seas, without daring to lose sight of land and committing himself to the mercy of the winds and the waves. 'It was astronomy that first inspired him with this

confidence, and taught him to conduct his vessel, with safety, through immense oceans, which had never before been traversed by man.

‘ In this difficult and hazardous enterprise it is not sufficient for him to know the position of the port he designs to visit ; he must also be able, at all times, to find upon what part of the globe he is, how far he has sailed, and what course he must pursue during the rest of the voyage. But these particulars can only be known from observations, and an accurate knowledge of the celestial motions.’ Independently of this knowledge, therefore, Vasco de Gama would never have doubled the Cape of Good Hope, and opened a channel for the riches of India to flow into the stores of Europe ; Columbus would not have disclosed the western world ; nor Cook have circumnavigated the globe, and visited the polar regions of the south.

Geography and Navigation are twin sisters—inseparable companions ; and whatever improves the one contributes to the perfection of the other. The ideas of latitude and longitude were first transferred from the heavens to the earth, when it was conceived that the same means by which the positions of the heavenly bodies had been indicated were equally applicable in fixing the situations of places on the surface of the terrestrial globe. When science had thus, as it were, assumed the helm, every fresh effort of navigation—every daring enterprise of the mariner, added something to our knowledge of the globe. Countries were disclosed which had been hidden from the creation, and people discovered whose very existence was previously unsuspected ; till almost every region has now been explored, and the productions of the earth conveyed from one extremity to the other.

But the influence of astronomy extends beyond the common affairs of life, in its tendency to enlarge the capacities of man, and increase the powers and penetration of his understanding. It dissipates the

superstitious notions and vain fears to which he is naturally prone; it expands the mind by the vastness of the views and objects it presents; and stores it with the most sublime and exalted ideas, not only of the works of creation, but of their all-wise and infinitely beneficent Author.

In the earlier ages of the world, as well as among the less civilized part of mankind at the present day, the unusual phenomena of nature always excite a painful degree of terror and consternation. An eclipse of the Sun or Moon has frequently been regarded as portending the annihilation of the universe; and the sudden appearance of a comet, with its blazing tail, as the harbinger of divine vengeance. But, in proportion as causes are understood, effects cease to be portentous; and astronomy has now happily banished such vain terrors, and enabled all the well-informed part of society not only to look upon comets and eclipses with tranquility and composure, but to derive both pleasure and instruction from those very phenomena which ignorance and apprehension had converted into causes of dismay.

Astrology is likewise another malady of untutored minds, by which the dark ages and places of the world have always been infested, and which astronomy has proved the most effectual means of eradicating. The cause of humanity is therefore under the most lasting obligations to this irradiating science, and to those individuals who have been so indefatigable in exploring the heavens, and rendering their discoveries subservient to the wants of life, and efficacious in exposing the fallaciousness of that dark and mysterious art which deludes the credulous, under pretence of searching into the secret designs of Providence, and explaining the hidden events of futurity.

The mind accustomed to contemplate the order and harmony of the celestial motions, and investigate the laws by which they are regulated; to examine the

magnitude of these immense orbs, and reflect upon the inconceivable velocity and undeviating accuracy with which they perform their revolutions, can hardly fail of expanding with the subject, or of having its erratic wanderings checked, and its tumultuous passions awed into subjection, by the grandeur and majestic sublimity of the scene. On this account, the wisest and greatest men of all ages have uniformly confessed themselves charmed with the beauties of this science. Poets, philosophers, and historians, have been emulous in its praises. Poets, in particular, have bestowed their highest encomiums on astronomy, which has furnished them with some of the noblest images, and the most exalted descriptions, that language can boast. A volume might easily be filled with specimens of this kind; but we shall only give the following beautiful simile from our immortal MILTON, describing the shield of Satan, in the first book of his inimitable *Paradise Lost*.

The broad circumference
 Hung on his shoulders like the Moon, whose orb
 Through optic glass the Tuscan artist views
 At evening from the top of Fesolè,
 Or in Valdarno, to descry new lands,
 Rivers, or mountains, in her spotty globe.

How admirably is this study calculated to impart the most exalted ideas of the works of creation! and thence to lead the contemplative mind, by almost imperceptible gradations,

Through Nature up to NATURE'S GOD!

For, wherever we turn our eyes, design and contrivance meet our view; wisdom in selecting, power in impelling, and superintendence in controuling, this stupendous machinery of the universe constantly arrest the attention. The learned Dr. PALRY, after taking a perspicuous view of the nature of astronomy, and contrasting it with the limited powers and duration of man, judiciously observes,

‘After all, the real subject of admiration is, that

we understand so much of astronomy as we do. That a being confined to the surface of one of the planets, bearing a less proportion to it than the smallest microscopic insect does to the plant it lives upon; that this little, busy, inquisitive creature, by the use of senses which were given to it for its domestic necessities, and by means of the assistance of those senses which it has the art to procure, should be enabled to observe the whole system of worlds to which its own belongs; the changes of place of the immense globes which compose it; and with such accuracy, as to mark out beforehand the situation in the heavens in which they will be found at any future point of time; and that these bodies, after sailing through regions of void and trackless space, should arrive at the place where they were expected, not within a minute, but within a few seconds of a minute, of the time prefixed and predicted: all this is wonderful, whether we refer our admiration to the constancy of the heavenly motions themselves, or to the perspicacity and precision with which they have been noticed by mankind. Nor is this the whole, nor indeed the chief part, of what astronomy teaches. By bringing reason to bear upon observation (the acutest reasoning upon the exactest observation), the astronomer has been able, out of the "mystic dance," and the confusion (for such it is) under which the motions of the heavenly bodies present themselves to the eye of a mere gazer upon the skies, to elicit their order and their real paths.

Our knowledge, therefore, of astronomy is admirable, though imperfect; and, amidst the confessed desiderata and desideranda, which impede our investigation of the wisdom of the Deity in these the grandest of his works, there are to be found in the phenomena ascertained circumstances and laws, sufficient to indicate an intellectual agency in three of its principal operations, viz. in choosing, in determining, in regulating; in *choosing*, out of a bound-

less variety of suppositions which were equally possible, that which is beneficial ; in *determining* what, left to itself, had a thousand chances against convenience for one in its favour ; in *regulating* subjects, as to quantity and degree, which, by their nature, were unlimited with respect to either.'—*Natural Theology*, p. 380, ed. 12.

Our limits preclude us from following this excellent reasoner through the arguments he adduces to establish these propositions ; and we shall therefore only remark, that it would be easy to shew that the following demonstrated facts include the whole.—The planets all move round the Sun, or, more strictly speaking, round the centre of the system, in the *same* direction ; though, in this respect, a vast variety was *equally* possible. They all move in nearly circular orbits ; and this fact embraces three circumstances ; the particular law of gravity, the first projectile direction, and the projectile velocity ; *each* of which was subject to an infinite number of modifications different from that adopted, and any one of which would have caused the orbit to which it applied to have been different from what it really is. And they all move nearly in the *same* plane, notwithstanding all that diversity that might *equally* have taken place in this respect also.

Notwithstanding these, however, and a thousand other cogent arguments that might be urged in favour of *creative intelligence*, it is still to be lamented that there have been, and perhaps still are, men who are so absorbed in the contemplation of *second* causes, as to overlook the FIRST and efficient Agent in the formation of this inconceivable assemblage of wonders ; by supposing that the same powers which now govern the material universe were at first capable of calling it into existence. But the inadequacy of these will immediately appear, if we consider that each of these immense bodies must either have been formed at its exact distance from their common cen-

tre of motion, or carried thither prior to receiving its projectile velocity. On the efficiency of these powers to produce the first of these effects, we apprehend the most strenuous advocates for mechanical agency will not insist; and with respect to the last, the reasoning of an eminent mathematician and philosopher will, therefore, not be unacceptable to our readers.

‘If we suppose the matter of the system to be accumulated in the centre by its gravity, no mechanical principles, with the assistance of this power of gravity, could separate the vast mass into such parts as the Sun and planets; and, after carrying them to their respective distances, project them in their several directions, preserving still the quality of action and reaction, or the state of the centre of gravity of the system. Such an excellent structure of things could only arise from the contrivance and powerful influences of an intelligent, free, and most potent agent. The same powers, therefore, which at present govern the material universe, and conduct its various motions, are very different from those which were necessary to have produced it from nothing, or to have disposed it in the admirable form in which it now proceeds.’—*Maclaurin’s Account of Newton’s Philosophy*.

Who then, that studies these magnificent works of creation with a simple, unprejudiced, and unperturbed mind, but will frequently be inclined to exclaim, with the enraptured YOUNG,

Who turns his eye on Nature’s midnight face,
But must inquire—‘What hand behind the scene,
What arm almighty, put these wheeling globes
In motion, and wound up the vast machine?
Who rounded in his palm these spacious orbs?
Who bowled them flaming through the dark profound,
And set the bosom of old night on fire?’
Nature’s controuler, author, guide, and end!

Or to join with THOMSON, in adoring that Being who formed them all ‘by the *breath* of his mouth;’

though without participating in the Stoical or Platonic sentiment his exquisite lines express :

Hail! source of being! universal soul
Of heaven and earth! essential presence, hail!
To THEE I bend the knee, to THEE my thoughts
Continual climb, who with a master-hand
Hast the great whole into perfection touched!

The Naturalist's Diary.

The cherished fields

Put on their winter robe of purest white:

'Tis brightness all; save where the new snow melts
Along the mazy current.

WINTER, to an inattentive eye, presents nothing, as it were, but the creation in distress: the orchards are stripped of their golden fruit; and harmony is extinct in the groves, now bending with the snow, 'their beauty withered and their verdure lost.' Yet, when we explore these dreary scenes, the mind is amply gratified in the contemplation of the various phenomena peculiar to this inclement season. Winter, ushered into existence by the howling of storms and the rushing of torrents, manifests, not less than the more pleasing seasons of the year, the wisdom and goodness of the great Creator.

At this time, indeed, scenes are presented to the view, which, were they less frequent, must strike with wonder and admiration the most incurious spectator. The solid crystal of our ponds and small rivers, the beauties communicated to every tree and bush on a clear morning succeeding a night of hoar frost, and the lustre of a field of snow, just glazed over with a frosty incrustation, are all pleasing objects to the attentive observer of Nature in all her varied forms of beauty. But, when their *utility* is considered, emotions of delight give place to those of gratitude to the Divine Arbiter of the seasons.

The great use of *snow* is to furnish a covering to the roots of vegetables, by which they are guarded from the influence of the atmospherical cold, and the internal heat of the earth is prevented from escaping. The internal parts of the earth are heated uniformly to the 48th degree of Fahrenheit's thermometer. This degree of heat is greater than that in which the watery juices of vegetables freeze, and it is propagated from the inward parts of the earth to the surface, on which the vegetables grow. The atmosphere being variably heated by the action of the sun in different climates, and, in the same climate, at different seasons, communicates to the surface of the earth, and to some distance below it, the degree of heat or cold which prevails in itself. Different vegetables are able to preserve life under different degrees of cold, but all of them perish, when the cold which reaches their roots is extreme¹. Providence has, therefore, in the coldest climates, provided a covering of snow for the roots of vegetables, by which they are protected from the influence of the atmospherical cold, and the internal heat of the earth is preserved. This is most strikingly exemplified in the following brief calendar of a Lapland year :—

- | | | |
|--------|-----|--------------------------|
| June | 23. | Snow melts. |
| July | 1. | Snow gone. |
| | 9. | Fields quite green. |
| | 17. | Plants at full growth. |
| | 25. | Plants in full blow. |
| August | 2. | Fruits ripe. |
| | 10. | Plants shed their seeds. |
| | 18. | Snow. |

From this time to the 23d of June, snow and ice resume their dominion ; the plants, from the coming

¹ The winter acornite, liverworts of various kinds, the *hepatica nobilis*, a species of narcissus, black bellebore, and the terrestrial mosses, only flourish, become impregnated, and fructify, amid the rigours of winter.

out of the ground to the ripening of their seeds, take but a month; and the spring, summer, and autumn, are crowded into the short space of fifty-six days. In such climates as this, Winter may be truly said

to rear his giant form,
His robe a mist, his voice a storm.

There is nothing more extraordinary in Russia (observes Dr. Clarke), than the transition of the seasons. The people of Moscow have no Spring: Winter *vanishes*, and Summer *is*! This is not the work of a week, or of a day, but of *one instant*; and the manner of it exceeds belief. We came from Petersburg to Moscow in sledges. The next day snow was gone. On the 8th of April, at mid-day, snow beat in at our carriage windows. On the same day, at sun set, arriving in Moscow, we had difficulty in being dragged through the mud to the commandant's. The next morning the streets were dry, the double windows had been removed from the houses, the casements thrown open, all the carriages were upon wheels, and the balconies filled with spectators. Another day brought with it the warmth of summer.

Another English traveller thus speaks of the Russian summer as it appeared to him in the year 1603: 'The woods are so fresh and so sweet, the pastures and meadows so greene and well growne, and that upon the suddain; such variety of flowers, such mealody of birdes (especially of nightingales), that a man shall not lightly travail in a more pleasant countrey; which fresh and speedy growth of the spring seemeth to proceede from the benefit of the *snowe, which all the winter time being spred over the whole countrey as a white rose*, and keeping it warme from the rigor of the frost, in the spring time, when the weather waxeth warme, and the sunne dissolveth it into water, doeth so thoroughly drench and soake the ground, being of a sleight and sandy mould, and

then shineth so hotly upon it againe, that it even forceth the hearbes and plants forth in great plenty and variety, and that in a shorte time.'

The most intense cold in England is usually felt in the month of January; and the weather is either bright with frost, or foggy with much snow:—

Thro' the husbed air the whitening show'r descends,
At first thin wav'ring; till, at last, the flakes
Fall broad, and wide, and fast, dimming the day
With a continual snow¹.

The inclemency of the season now compels the numerous tribes of birds to quit their retreats in search of food. The redbreast (*sylvia rubecula*), the only bird that confides in man, begins to sing. To this universal favourite many beautiful addresses have been penned: there are scarcely any more pleasing than the following stanzas by Mr. MONTGOMERY, from '*Verses to a Robin Redbreast, who visits the Windows of my Prison every Day*,'

Welcome, pretty little stranger!
Welcome to my lone retreat!
Here, secure from every danger,
Hop about, and chirp, and eat.
ROBIN! how I envy thee,
Happy child of liberty!

Now, though the tyrant Winter howling,
Shakes the world with tempests round;
Heaven above, with vapours scowling,
Frost imprisons all the ground;—
ROBIN! what are these to thee?
Thou art blest with liberty.

Though yon fair majestic river
Mourns in solid icy chains;
Though yon flocks and cattle shiver
On the desolated plains;
ROBIN! thou art gay and free,
Happy in thy liberty.

¹ See the '*Contemplative Philosopher*,' vol. i, No. i—v, for some interesting remarks on Winter, and its extreme severity in the polar regions,

Hunger never shall distress thee,
 While my cates one crumb afford;
 Colds nor cramps shall ne'er oppress thee;
 Come and share my humble board.
 ROBIN! come and live with me,
 Live,—yet still at liberty¹.

About the beginning of the month, larks (*alauda arvensis*) congregate, and fly to the warm stubble for shelter; and the nut-hatch (*sitta europæa*) is heard. The shell-less snail or slug (*limax*) makes its appearance, and commences its depredations on garden plants and green wheat. The missel-thrush (*turdus viscivorus*) begins its song. The hedge-sparrow (*sybia modularis*), and the thrush (*turdus musicus*), begin to sing. The wren, also, 'pipes her perennial lay,' even among the flakes of snow. The titmouse (*parus*) pulls straw out of the thatch, in search of insects; linnets (*fringilla linota*) congregate; and rooks (*corvus frugilegus*) resort to their nest trees. Pullets begin to lay; young lambs are dropped now.

The house-sparrow (*fringilla domestica*) chirps; the bat (*vespertilio*) appears; spiders shoot out their webs; and the blackbird (*turdus merula*) whistles. The fieldfares, red-wings, skylarks, and titlarks, resort to watered meadows for food, and are, in part, supported by the gnats which are on the snow, near the water. The tops of tender turnips and ivy-berries afford food for the graminivorous birds, as the ring-dove, &c.

While yet the wheaten blade
 Scarce shoots above the new-fall'n show'r of snow,
 The skylark's note, in short excursion, warbles;
 Yes! ev'n amid the day-obscuring fall,
 I've marked his wing winnowing the feathery flakes,

¹ To ROBIN REDBREAST.

Laid out for dead, let thy last kindness be
 With leaves and moss-work for to cover me;
 And, while the wood nymphs my cold corpse inter,
 Sing thou my dirge, sweet warbling chorister!
 For epitaph, in foliage next write this:
 'Here, here, the tomb of Robert Herrick is.' HERRICK.

In widely-circling horizontal flight,
 But when the season genial smiles, he towers
 On loftier poise, with sweeter, fuller pipe,
 Cheering the ploughman at his furrow end—
 The while he clears the share, or, listening, leans
 Upon his paddle-staff, and with his raised hand
 Shadows his half-shut eyes, striving to scan
 The songster melting in the flood of light.

GRAHAME.

Earth-worms lie out on the ground; and the shell-snail (*helix nemoralis*) appears. The chaffinch (*fringilla cœlebs*) sings; jackdaws repair to the tops of churches; and the grey and white wagtail (*motacilla, boarula & alba*) appear. Snipes, woodcocks, herons, wild-ducks, and other water-fowl, retire from the frozen marshes to streams that are still open; and, as the cold strengthens, sea-birds come up the river in quest of food.

The snipe, though sorely pinched and half reduced
 In bulk, still braves the year; with prying bill
 Bores the tight-covered stream; and should it fail,
 By hunger tamed, drops in the trickling drain
 Near dreaded man's abode.

But this is not the only bird which becomes the prey of the fowler, at this season of the year:—

a far nobler spoil
 Awaits him on the river; where the rocks
 Aiding the roaring stream, it keeps at bay
 The eager frost, and many a broken pool,
 Half liquid and half solid, forms; the haunt
 Of all the kindred tribes that love to cleave.
 With glossy breast and paddling feet the flood;
 Widgeon, or teal, or duck, majestic swan
 Or heavy goose, with many a fowl beside
 Of lesser size and note.

FOWLING, a Poem.

The farmer exerts all his care in tending the domestic cattle. Cows can scarcely pick out any grass, and depend chiefly on hay for support; early lambs and calves are housed, and watched with almost paternal solicitude. Hares, impelled by hunger, find their way into our gardens, to browse on the cultivated vegetables; and rabbits enter plantations, and commit great

havoc by stripping trees of their bark. The sharp-eyed fox steals from the wood, and makes his incursions into the hen-roost and farmyard. The weasel and polecat also continue their depredations. The cold-blooded animals, as the frog, snake, and lizard, are quite benumbed by the cold, and so remain till the approach of warm weather. The dormouse, marmot, &c. take their winter sleep; while the squirrel and the field-mouse subsist, in their retreat, upon the provision which they have laid up during the autumn.

In our last volume (p. 28), we gave some account of the passage of St. Bernard, in illustration of the severity of an Alpine winter; we now, as a pleasing companion to this description, quote the following lines from Mr. Coleridge's little known, but sublime, 'Hymn before Sun-rise in the Valley of Chamouny.'

Ye ice-falls! ye that from the mountain's brow
 Adown enormous ravines slope amain—
 Torrents, methinks, that heard a mighty voice,
 And stopped at once amid their maddest plunge!
 Motionless torrents! silent cataracts!
 Who made you glorious, as the gates of heaven,
 Beneath the keen full Moon? who bade the Sun
 Clothe you with rainbows? who with living flowers
 Of loveliest blue¹ spread garlands at your feet?
 God! let the torrents, like a shout of nations,
 Answer! and let the ice plains echo, God!
 God! sing ye meadow streams! with gladsome voice!
 Ye pine-groves, with your soft and soul-like sounds!
 And they too have a voice, yon piles of snow,
 And in their perilous fall shall thunder, God!
 Ye living flowers, that skirt th' eternal frost!
 Ye wild goats, sporting round the eagle's nest!
 Ye eagles, playmates of the mountain storm!
 Ye lightnings, the dread arrows of the clouds!
 Ye signs and wonders of the element!
 Utter forth God, and fill the hills with praise!²

In this month, the flowers of the rosemary (*rosma-*

¹ Within a few paces of the Glaciers, the *Gentiana major* grows in immense numbers, with its 'flowers of loveliest blue.'

² See Mr. Coleridge's 'Friend,' p. 175. For a full account of the stupendous works of an almighty hand in this celebrated Valley, we refer to Mr. Henry Coxe's *Traveller's Guide in Switzerland*, published in 1816, by Sherwood and Co.

rinus officinalis) begin to open; the winter aconite (*helleborus hiemalis*), and the bear's foot (*h. foetidus*), are in flower about the middle of the month; the mezereon (*daphne m.*) 'breathes mild its early sweets;' and the red dead-nettle (*lamium purpureum*) flowers under the shelter of southern hedges. The snowdrop (*galanthus nivalis*) seems on the point of blowing.

Ye simple snowdrops! firstlings of the year!
 Fairest of flowers! sweet harbingers of spring!
 How meekly do you hang your silv'ry heads!
 Like maidens coyly stealing from the view!

The common creeping crowfoot (*ranunculus repens*) is now in flower; and the crocus, if the weather be mild, appears above ground. Ivy casts its leaves; the catkin, or male blossom of the hazel (*corylus avellana*), unfolds; the flowers of the holly (*ilex aquifolium*) begin to open; and the leaves of the honeysuckle (*lonicera periclymenum*) are quite out. Towards the end of January, the daisy (*bellis perennis*) is in full bloom. In naming this pretty flower, we willingly quote the beautiful lines of a sweet, but neglected, poet:—

Her¹ divine skill taught me this,
 That from every thing I saw
 I could some instruction draw,
 And raise pleasure to the height
 Through the meanest object's sight.
 By the murmur of a spring,
 Or the least bough's rustelling;
 By a DAISY, whose leaves spread,
 Shut when Titan goes to bed;
 Or a shady bush or tree;
 She could more infuse in me
 Than all Nature's beauties can
 In some other wiser man.

G. WITHER².

The china rose (*rosa chinensis* and *rosa semperflorens*), till lately unknown to us, and at first considered only as a greenhouse plant, is now seen in blow

¹ His Muse.

² See Mr. Wordsworth's Poems, 8vo, 2 vols. 1815, for several poems on the Daisy.

in the open air, even in the month of December, often with its red buds mossed with frost. The wallflower (*cheiranthus*), periwinkle (*vinca, major & minor*), and heart's-ease (*viola tricolor*), are still in blow.

The golden saxifrage, called also golden moss, and stonecrop (*chrysoplenium*), in the absence of other flowers, affords its little aid to give life and beauty to the garden. The bramble (*rubus fruticosus*) still retains its leaves, and gives a thin scattering of green in the otherwise leafless hedges; while the berries of the hawthorn, the wild rose, and the spindle-tree, afford their brilliant touches of red. The twigs of the red dogwood, too, give a richness amid the general brown of the other shrubs.

In this month, the farmer carries out manure to his fields, and repairs quickset hedges; taking advantage of the dry and hard ground, during frost. The barn resounds with the flail, barley being now threshed for maling. He lops forest-trees, and cuts timber for winter use. About the end of the month, in dry weather, peas and beans are sown, and vetches for seed or fodder. Hogs are killed for bacon, and beef and hams are smoked.

Hunting and shooting are among the favourite amusements of this season. Skating, also, is much practised by young persons.

Though the cheerful scenes of a great city, its glittering shops, 'passing thousands,' and countless attractions of every kind, draw many from the country at this season, there are even now 'rural sights and rural sounds,' which have much to 'charm the eye, the ear to please,' particularly when

the Sun extends his cheering beam,
And all the landscape casts a golden gleam:
Clear is the sky, and calm and soft the air,
And through thin mist each object looks more fair.

Then, where the villa rears its sheltering grove,
Along the southern lawn 'tis sweet to rove:
There dark green pines, behind, their boughs extend,
And bright spruce firs like pyramids ascend,

And round their tops, in many a pendent row,
 Their scaly cones of shining auburn show ;
 There the broad cedar's level branches spread,
 And the tall cypress lifts its spiry head ;
 With alaternus ilex interweaves,
 And laurels mix their glossy oval leaves ;
 And gilded holly crimson fruit displays,
 And white viburnum ¹ o'er the border strays.

Where these from storms the spacious greenhouse screen,
 Ev'n now the eye beholds a flowery scene ;
 There crystal sashes ward th' injurious cold,
 And rows of benches fair exotics hold ;
 Rich plants, that Afric's sunny cape supplies,
 Or o'er the isles of either India rise.

While striped geranium shows its tufts of red,
 And verdaat myrtles grateful fragrance shed ;
 A moment stay to mark the vivid bloom,
 A moment stay to catch the high perfume.

JOHN SCOTT.

FEBRUARY.

SOME etymologists derive February from *Februa*, an epithet given to Juno, as the goddess of purification ; while others attribute the origin of the name to *Februa*, a feast held by the Romans in this month, in behalf of the manes of the deceased. The Saxons named February *sprout kele*, on account of the sprouts of the cole-wort which began to appear in this month.

Remarkable Days.

2.—SEPTUAGESIMA SUNDAY.

WHEN the words Septuagesima, Sexagesima, and Quinquagesima (seventieth, sixtieth, and fiftieth), were first applied to denote these three Sundays, the season of Lent had generally been extended to a fast

¹ That well-known beautiful flowering evergreen, commonly called Laurustinus.

of six weeks, that is, thirty-six days, not reckoning the Sundays, which were always celebrated as festivals.

2.—PURIFICATION OF THE BLESSED VIRGIN MARY.

This festival is of high antiquity, and the antient Christians observed it by using a great number of lights; in remembrance, as it is supposed, of our blessed Saviour's being declared by Simeon, to be 'a light to lighten the Gentiles:' hence the name of Candlemas-day.

3.—SAINT BLASE.

He was Bishop of Sebaste, in Armenia, and suffered martyrdom in 316, under the persecution of Licinius. Blase is the principal patron of Ragusa, and also of the woolcombers, who still keep a solemn guild at Norwich, in memory of their tutelar saint.

5.—SAINT AGATHA.

Saint Agatha suffered martyrdom under Decius, in the year 251. She was honourably descended, and very beautiful. Her personal charms soon attracted the notice of Quintianus, prætor or governor of the province; who, being unable to accomplish his base designs, ordered her to be scourged, and then imprisoned, for not worshipping the Pagan deities. After which, still persisting in the faith, she was put to the rack, burnt with hot irons, and had her breasts cut off.

*6. 1685.—JAMES II BEGAN TO REIGN.

In many respects it must be owned that he was a virtuous man, as well as a good monarch. He was frugal of the public money; he encouraged commerce with great attention; he applied himself to naval affairs with success; he supported the fleet as the glory and protection of England. He was also zealous for the honour of his country; he was capable of supporting its interests with a degree of dignity in the scale of Europe. In his private life he was almost irreproachable; he was an indulgent parent, a tender husband, a generous and steady friend; in his deportment he was affable, though stately: he be-

stowed favours with peculiar grace ; he prevented solicitation by the suddenness of his disposal of places : though scarce any prince was ever so generally deserted, few ever had so many private friends ; those who injured him most were the first to implore his forgiveness, and, even after they had raised another prince to the throne, they respected his person, and were anxious for his safety. To these virtues he added a steadiness of counsels, a perseverance in his plans, and courage in his enterprises. He was honourable and fair in all his dealings ; he was unjust to men in their principles, but never with regard to their property. Though few monarchs ever offended a people more, he yielded to none in his love of his subjects ; he even affirmed, that he quitted England to prevent the horrors of a civil war, as much as from fear of a restraint upon his person from the Prince of Orange. His great virtue was a strict adherence to facts and truth in all he wrote and said, though some parts of his conduct had rendered his sincerity in his political professions suspected by his enemies.—*Macpherson*.

***8. 1587.—MARY QUEEN OF SCOTS BEHEADED.**

This beautiful, accomplished, interesting, and unfortunate woman, after being ranked among the most abandoned of her sex for nearly two centuries, owing to the envy and malice of her rival cousin and sister, Queen Elizabeth, has at length found champions in Mr. Goodall, Mr. Tytler, and Mr. Whitaker, who have vindicated her character, and shown, that, if, in some respects, she was imprudent,—yet that she is more to be pitied than censured, and more pure than her calumniators,—and that one of her greatest errors was confiding in her who was seeking her life.

On Tuesday the 7th of February, the earls of Shrewsbury and Kent arrived at Fotheringay, and, demanding access to the queen, read in her presence the warrant for execution, and required her to prepare to die next morning. Mary heard them to the end,

without emotion, and crossing herself in the name of the Father, and of the Son, and of the Holy Ghost, 'That soul,' said she, 'is not worthy of the joys of heaven, which repines because the body must endure the stroke of the executioner; and though I did not expect that the queen of England would set the first example of violating the sacred person of a sovereign prince, I willingly submit to that which Providence has decreed to be my lot;' and laying her hand on a Bible, which happened to be near her, she solemnly protested that she was innocent of that conspiracy which Babington had carried on against Elizabeth's life. She then mentioned the requests contained in her letter to Elizabeth, but obtained no satisfactory answer. She entreated, with particular earnestness, that now, in her last moments, her almoner might be suffered to attend her, and that she might enjoy the consolation of those pious institutions prescribed by her religion. Even this favour, which is usually granted to the vilest criminal, was absolutely denied.

Her attendants, during this conversation, were bathed in tears, and, though overawed by the presence of the two earls, with difficulty suppressed their anguish; but no sooner did Kent and Shrewsbury withdraw, than they ran to their mistress, and burst out into the most passionate expressions of tenderness and sorrow. Mary, however, not only retained perfect composure of mind, but endeavoured to moderate their excessive grief; and falling on her knees, with all her domestics around her, she thanked heaven that her sufferings were now so near an end, and prayed that she might be enabled to endure what still remained with decency and with fortitude. The greater part of the evening she employed in settling her worldly affairs. She wrote her testament with her own hand. Her money, her jewels, and her clothes, she distributed among her servants, according to their rank or merit. She wrote a short letter to the King of France, and another to the Duke of Guise, full of

tender but magnanimous sentiments, and recommended her soul to their prayers, and her afflicted servants to their protection. At supper she ate temperately, as usual, and conversed not only with ease, but with cheerfulness; she drank to every one of her servants, and asked their forgiveness, if ever she had failed in any part of her duty towards them. At her wonted time she went to bed, and slept calmly a few hours. Early in the morning she retired into her closet, and employed a considerable time in devotion. At eight o'clock the high sheriff and his officers entered her chamber, and found her still kneeling at the altar. She immediately started up, and with a majestic mien, and a countenance undismayed, and even cheerful, advanced towards the place of execution, leaning on two of Paulet's attendants. She was dressed in a mourning habit, but with an elegance and splendour which she had long laid aside, except on a few festival days. An agnus dei hung by a pomander chain at her neck; her beads at her girdle; and in her hand she carried a crucifix of ivory. At the foot of the stairs the two earls, attended by several gentlemen from the neighbouring counties, received her; and there Sir Andrew Melvil, the master of her household, who had been secluded for some weeks from her presence, was permitted to take his last farewell. At the sight of a mistress whom he tenderly loved, in such a situation, he melted into tears; and as he was bewailing her condition, and complaining of his own hard fate, in being appointed to carry the account of such a mournful event into Scotland, Mary replied, 'Weep not, good Melvil; there is at present great cause for rejoicing. Thou shalt this day see Mary Stewart delivered from all her cares, and such an end put to her tedious sufferings as she has long expected. Bear witness that I die constant in my religion; firm in my fidelity towards Scotland; and unchanged in my affection to France. Commend me to my son. Tell him I have

done nothing injurious to his kingdom, to his honour, or to his rights ; and God forgive all those who have thirsted, without cause, for my blood.'

With much difficulty, and after many entreaties, she prevailed on the two earls to allow Melvil, together with three of her men-servants and two of her maids, to attend her to the scaffold. It was erected in the same hall where she had been tried, raised a little above the floor, and covered, as well as the chair, the cushion, and block, with black cloth. Mary mounted the steps with alacrity, beheld all this apparatus of death with an unaltered countenance, and, signing herself with the cross, she sat down in the chair. Beale read the warrant for execution with a loud voice, to which she listened with a careless air, and like one occupied in other thoughts. Then the Déan of Peterborough began a devout discourse, suitable to her present condition, and offered up prayers to heaven in her behalf ; but she declared that she could not in conscience hearken to the one, nor join with the other, and, falling on her knees, repeated a Latin prayer. When the dean had finished his devotions, she, with an audible voice, and in the English tongue, recommended unto God the afflicted state of the church, and prayed for prosperity to her son, and for a long life and peaceable reign to Elizabeth. She declared that she hoped for mercy only through the death of Christ, at the foot of whose image she now willingly shed her blood ; and, lifting up and kissing the crucifix, she thus addressed it : ' As thy arms, O Jesus, were extended on the cross ; so with the outstretched arms of thy mercy receive me, and forgive my sins !'

She then prepared for the block, by taking off her veil and upper garments ; and one of the executioners rudely endeavouring to assist, she gently checked him, and said, with a smile, that she had not been accustomed to undress before so many spectators, nor to be served by such valets. With calm but undaunted

fortitude she laid her neck on the block; and while one executioner held her hands, the other, at the second stroke, cut off her head, which, falling out of its attire, discovered her hair already grown quite grey with cares and sorrows. The executioner held it up still streaming with blood, and the dean crying out, 'So perish all Queen Elizabeth's enemies,' the Earl of Kent alone answered, Amen. The rest of the spectators continued silent, and drowned in tears; being incapable at that moment of any other sentiments but those of pity or admiration.—*Robertson*.

9.—SEXAGESIMA SUNDAY.—See SEPTUAGESIMA,
p. 30.

*9. 1555.—BISHOP HOOPER BURNT.

This venerable man, one of the first victims of the 'bloody Mary,' was sent under the guard of a troop of horse towards Gloucester, where it was determined that he should be burnt in the midst of his affectionate and sorrowful flock. Being led to the stake, he was not suffered to speak to the weeping crowd, and was there used in the most barbarous manner; for the fire being made of green wood, his lower limbs were slowly consumed, while his vitals were unaffected, and he underwent the most dreadful torments for above three quarters of an hour. He bore them, however, with admirable patience and fortitude, and the last words which he was able to utter were, 'Lord Jesus, receive my spirit!'

*11. 1763.—SHENSTONE DIED.

Children coming from School.

But now Dan Phœbus gains the middle sky,
And Liberty unbars her prison-door,
And like a rushing torrent out they fly,
And now the grassy cirque had covered o'er
With boisterous revel-rout and wild uproar;
A thousand ways in wanton rings they run,
Heav'n shield their short-lived pastimes, I implore!
For well may freedom, erst so dearly won,
Appear to British elf more gladsome than the sun.

Enjoy, poor imps ! enjoy thy sportive trade,
 And chase gay flies, and cull the fairest flowers,
 For when my bones in grass-green sods are laid,
 For never may ye taste more careless hours
 In knightly castles or in ladies bowers.
 O vain to seek delight in earthly thing !
 But most in courts, where proud Ambition towers ;
 Deluded wight ! who weens fair peace can spring
 Beneath the pompous dome of kesar or of king.

See in each sprite some various bent appear !
 These rudely carol, most incondite lay ;
 Those sauntering on the green, with jocund leër
 Salute the stranger passing on his way ;
 Some builden fragile tenements of clay,
 Some to the standing lake their courses bend,
 With pebbles smooth at *duck and drake* to play ;
 Think to the huckster's savoury cottage tend,
 In pastry kings and queens th' allotted mite to spend.

Here, as each season yields a different store,
 Each season's stores in order ranged been,
Apples with cabbage-net y-covered o'er,
 Galling full sore th' unmoneyed wight, are seen,
 And *gooseberry*, clad in livery red or green ;
 And here of lovely dye the *catherine pear*,
 Fine pear ! as lovely for thy juice I ween ;
 O may no wight e'er pennyless come there,
 Lest, smit with ardent love, he pine with hopeless care

See ! *cherries* here, ere *cherries* yet abound,
 With thread so white in tempting posies tied,
Scattering like blooming maid their glances round,
 With pampered look draw little eyes aside,
 And must be bought, though penury betide ;
 The *plum* all azure, and the *nut* all brown,
 And here, each season, do those cakes abide
 Whose honoured names th' inventive city own,
 Rendering through Britain's isle Salopia's praises known.

The SCHOOLMISTRESS.

*12. 1554.—LADY JANE GREY AND HER
 HUSBAND BEHEADED.

It had been intended to execute the Lady Jane and Lord Guilford together on the same scaffold, at Tower-hill ; but the council, dreading the compassion of the people for their youth, beauty, innocence,

and noble birth, changed their orders, and gave directions that she should be beheaded within the verge of the Tower. She saw her husband led to execution, and having given him from the window some token of her remembrance, she waited with tranquillity till her own appointed hour should bring her to a like fate. She even saw his headless body carried back in a cart ; and found herself more confirmed by the reports, which she heard of the constancy of his end, than shaken by so tender and melancholy a spectacle. Sir John Gage, constable of the Tower, when he led her to execution, desired her to bestow on him some small present, which he might keep as a perpetual memorial of her. She gave him her table-book, in which she had just written three sentences, on seeing her husband's dead body ; one in Greek, another in Latin, and a third in English. The purport of them was, ' that human justice was against his body, but the Divine Mercy would be favourable to his soul : and that if her fault deserved punishment, her youth, at least, and her imprudence, were worthy of excuse ; and that God and posterity, she trusted, would show her favour.'—*Hume*.

Lady Jane Grey, before she was twelve years old, was mistress of eight languages. She wrote and spoke the English tongue with elegance and accuracy. French, Italian, Latin, and even Greek, she possessed to a perfection as if they were native to her, and she had made some progress in Hebrew, Chaldee, and Arabic. Yet she did not, like some learned ladies I have heard of, in pursuit of these extraordinary acquisitions, fall into any neglect of those more useful and ornamental arts, which are peculiarly to be desired in the female sex. The delicacy of her taste displayed itself in the variety of her needle-works, and even in the beauty and regularity of her hand-writing. She played admirably upon various instruments of music, and accompanied them with a voice peculiarly sweet.

It was in the summer 1550, when she was exactly

thirteen years of age, that she received a visit at Broadgate from Roger Ascham, schoolmaster to the princess Elizabeth. He had become acquainted with her in the court of King Edward VI, and had been equally struck with the greatness of her attainments, and the sweetness of her character.

When he arrived he found that the Marquis and Marchioness of Dorset, with all their attendants of either sex, were gone a hunting in the park. Lady Jane however was in her apartment, and when Mr. Ascham was introduced, he found her busy, reading the *Phædon* of Plato in the original Greek. Astonished at what he saw, after the first compliments, the venerable instructor asked her, why she lost such pastime as there must needs be in the park? At which smiling, she answered, 'I wisse all their sport in the park is but a shadow to that pleasure that I find in Plato. Alas, good folk, they never felt what true pleasure meant!' This naturally leading him to inquire how a lady of her age had attained to this deep knowledge of pleasure, and what had allured her to it, she made the following reply: 'I will tell you, and tell you a troth, which perchance ye will marvel at. One of the greatest benefits that ever God gave me, is that he sent me so sharp and severe parents, and so gentle a schoolmaster. For, when I am in presence either of father or mother, whether I speak, keep silence, sit, stand, or go, eat, drink, be merry, or sad, be sewing, playing, dancing, or doing any thing else, I must do it as it were in such weight, measure, and number, even so perfectly as God made the world; or else I am so sharply taunted, so cruelly threatened, yea presently sometimes with pinches, nips, and bobs, and other ways (which I will not name, for the honour I bear them), so without measure misordered, that I think myself in Hell, till the time come that I must go to Mr. Aylmer, [one of Lady Jane's preceptors, afterwards Bishop of London,] who teacheth me so gently, so pleasantly, with such fair allurements to learning, that I think all the time nothing whiles I am

with him. And, when I am called from him, I fall on weeping, because whatsoever I do else but learning, is full of grief, trouble, fear, and wholly misliking unto me. And thus my book hath been so much my pleasure, and bringeth daily to me more pleasure and more, that in respect of it all other pleasures in very deed be but trifles and very troubles unto me.'—*Marcliffe*.

*12. 1768.—FRANCIS II, EMPEROR OF AUSTRIA,
BORN.

14.—SAINT VALENTINE.

Valentine was an antient presbyter of the church ; he suffered martyrdom in the persecution under Claudius II, at Rome ; being beaten with clubs, and then beheaded, in the *Via Flaminia*, about the year 270.

The day Saint Valentine,
When maids are brisk, and at the break of day
Start up and turn their pillows, curious all
To know what happy swain the fates provide
A mate for life. Then follows thick discharge
Of true-love knots and sonnets nicely penned,
But to the learned critic's eye no verse,
But prose distracted.

MURDIS.

VALENTINE'S DAY.

The tuneful choir in amorous strains
Accost their feathered loves;
While each fond mate, with equal pains,
The tender suit approves.
With cheerful hop from spray to spray
They sport along the meads;
In social bliss together stray,
Where love or fancy leads.
Through Spring's gay scenes each happy pair
Their fluttering joys pursue;
Its various charms and produce share,
For ever kind and true.
Their sprightly notes from every shade
Their mutual loves proclaim;
Till Winter's chilling blasts invade,
And damp th' enlivening flame.

Then all the jocund scene declines,
Nor woods nor meads delight;
The drooping tribe in secret pines,
And mourns th' unwelcome sight.

Go, blissful warblers! timely wise,
Th' instructive moral tell;
Nor thou their meaning lays despise,
My charming Annabelle!

JAGO.

16.—QUINQUAGESIMA SUNDAY.—See SEPTUAGESIMA, p. 30.

18.—SHROVE TUESDAY.

This day is also called 'Fastern's Een' and Pancake Tuesday. *Shrove* is the preterite of *shrive*, an antiquated word, which signifies to hear or make confession. On this day it was usual for the people to *confess*, that they might be the better prepared for the observation of the ensuing season of penitence, and for receiving the sacrament at Easter. It was afterwards converted into a day of idle sports and amusements; and within these few years, in many parts of England, its anniversary was distinguished by riot and drunkenness, by bull-baiting, *cock-fighting*, and such other diversions as were calculated to promote cruelty and inhumanity. The Popish *Carnival* commences from Twelfth-day, and holds till Lent. See T. T. for 1815, p. 48.

*18. 1546.—LUTHER DIED.

19.—ASH WEDNESDAY.

Lent is not of apostolic institution, nor was it known in the earlier ages of the Christian church. This day was formerly called *Caput Jejuni*, the head of the fast, and *Dies Cinerum*, or Ash Wednesday. The latter appellation is derived from the discipline of the ancient church, in regard to penitents, who, on the first day of Lent, had ashes thrown upon them, and their heads covered with sackcloth.

24.—SAINT MATTHIAS.

Matthias was, probably, one of the seventy disciples, and was a constant attendant upon our Lord, from the time of his baptism by St. John until his ascension. He was afterwards, near the river Asparus, murdered by some barbarians. The gospel and traditions published under his name are considered spurious.

*25. 1723.—SIR CHRISTOPHER WREN DIED.

The churches, the royal courts, the stately halls, magazines, palaces, and other public structures designed by Sir Christopher Wren, are proud trophies of his unparalleled genius, and lasting monuments of British talent. If the whole art of building were lost, it might be again recovered in the cathedral of *St. Paul*, and in that grand historical pillar the *Monument*. These would alone have eternized his memory; but when we superadd *Greenwich Hospital*, *Chelsea Hospital*, the *theatre at Oxford*, *Trinity College Library*, and *Emanuel College, Cambridge*—the churches of *St. Stephen in Walbrook*, *St. Mary-le-bow*, and FIFTY-TWO others in *London*—while we contemplate these, and many other public edifices erected or repaired under his direction, we are at a loss which most to admire—the fertile ingenuity or the persevering industry of the artist. ‘*Lector, si monumentum requiris,—circumspice.*’

26.—EMBER WEEK.

The Ember days are the Wednesday, Friday, and Saturday after the first Sunday in Lent, and after the 13th of December. It is enjoined by a canon of the church, ‘that deacons and ministers be ordained, or made, but only on the Sundays immediately following these Ember feasts.’—*Nelson*.

*26. 1802.—DR. GEDDES DIED.

MACARONIC VERSES.

*All in a word, qui se oppressos most heavily credunt
Legibus injustis, test-oathibus atque profanis;*

*While high-church homines in ease et luxury vivunt;
Et placeas, postas, mercedes, munia, graspan!*
Hi cuncti keen were; fari aut pugnare parati
Prisca pro causa.

GEDDES.

Astronomical Occurrences

In FEBRUARY 1817.

THE Sun enters Pisces on the 18th, at 38 m. past 10 at night. On the 9th, at 3 in the morning, Mercury will be in his inferior conjunction; and on the 21st he will appear stationary. On the 10th, Saturn will be in conjunction with the star marked 2 in Aquarius, the star being 47' south. On the 18th, also, Venus will be in conjunction with the star ϵ in κ , the star being 19' north of the planet. Saturn will be in conjunction on the 15th, at 15 m. past 1 in the afternoon. And Jupiter will be in quadrature on the 28th, at 1 in the afternoon.

TABLE
*Of the Sun's Rising and Setting for every fifth
Day of the Month.*

Saturday, Feb. 1,	Sun rises 27 m. after 7.	Sets 33 m. after 4
Thursday, — 6,	. . . 18 . . . 7 .	42 . . . 4
Tuesday, — 11,	. . . 9 . . . 7 .	51 . . . 4
Sunday, — 16,	. . . 0 . . . 7 .	0 . . . 5
Friday, — 21,	. . . 50 . . . 6 .	10 . . . 5
Wednesday, — 26,	. . . 41 . . . 6 .	19 . . . 5

In order to find the true time by a good sun-dial, the numbers in the following Table must be added to the apparent time, as shewn by that instrument, for every 5th day of the month.

TABLE.

February 1, to the time on the dial	add	m.	s.
6,	13	59
11,	14	28
16,	14	37
21,	14	27
26,	13	59
26,	13	15

The following example will explain the use of this Table to such of our readers as have not previously attended to the subject; and for this purpose we insert it.—*Ex.* Suppose that, on the 16th of January, the time on a good sun-dial was observed to be 20 m. past 2; and it was required to find the *mean* or *true* time answering to that instant; this is obtained by adding the equation of time for the given day to the time observed on the dial; hence $2\text{ h. } 20\text{ m. } + 10\text{ m. } 10\text{ s.} = 2\text{ h. } 30\text{ m. } 10\text{ s.}$; the time required.

If the given day is not one of those stated in the preceding Table, the quantity to be added to the observed time must be found by proportion. Thus, take the difference corresponding to the two days in the Table between which the given day falls, and also the first of these two days from that for which the time is required; then say, as 5 is to this last difference, so is the first difference to a fourth number; which added to the number answering to the first of the days that was taken from the Table, gives the quantity to be added to the observed time. Suppose it were required to find the mean time corresponding to 3 h. in the afternoon of the 24th of Jan. observed on a good sun-dial; then the difference of the numbers answering to the two nearest days in the Table (21 and 26) is 12 m. 58 s.—11 m. 44 s. = 1 m. 14 s., or 74 s.; and $24 - 21 = 3$; therefore, $5 : 3 :: 74\text{ s.} : 44\text{ s.}$; which being added to the number answering to the 21st day, gives 11 m. 44 s. + 44 s. = 12 m. 28 s.; and consequently 3 h. 12 m. 28 s. is the mean time required.

The Moon will be full at 15 m. past 2 on the morning of the 2d. She will enter her last quarter at 47 m. past 7 on the evening of the 8th. There will be a new Moon on the 16th, at 19 m. after 4 in the morning; and her first quarter will commence at 27 m. after 8 on the morning of the 24th.

The Moon will pass the first meridian at a conve-

nient time for observation, on the following days of this month, viz.

8th day, at 11m. past 5 in the morning.	
9th . . . 4 . . . 6	
10th . . . 59 . . . 6	
25th . . . 55 . . . 6 in the evening.	
26th . . . 50 . . . 7	
27th . . . 47 . . . 8	
28th . . . 45 . . . 9	

The eclipses of Jupiter's first and second satellite for this month, as visible at Greenwich and its neighbourhood, will be as follow :

IMMERSIONS.

1st Satellite, Feb. 13, .	m.	s.	
	48	57	past 5 in the morning.
2d Satellite, — 19, .	36	46	past 3

There will also be an eclipse of the third satellite on the 22d. The immersion will take place at $\frac{1}{2}$ past 3 in the morning, and the emersion at 40 m. past 5, A.M.

On the Obliquity of the Ecliptic.

THE values assigned to the obliquity of the ecliptic, by astronomers of different ages, are different ; and regularly diminish, from the most distant periods at which observations have been recorded to the present time. Nor can these differences be entirely attributed either to the imperfection of instruments or observations ; for this cause would sometimes have given the results too great, and at others too little ; and there is almost an infinity of chances to one that they should all agree in indicating this progressive diminution if it were not real. The theory of universal gravitation also completely confirms the same result. By this it is proved that the different attractions of the planetary bodies of which the solar system is composed, ought necessarily to cause a change in this obliquity ; and according to the actual disposition of this system, the inclination of the plane of the ecliptic to that of the

equator ought to diminish by a quantity nearly equal to fifty seconds in a century, or about half a second a year. M. Laplace has published, in the *Connais-sance des Temps*, for 1811, a Table of the observed obliquity at distant intervals, compared with the calculated obliquity for the same epochs ; and of which the following is the substance :

BEFORE THE CHRISTIAN ERA.

Date of the Observation.	Observed Obliquity.	Calculated Obliquity.	Excess or defect of the Observation.
1100	23°.900553	23°.866128	+0°.034425
350	23 .822217	23 .768613	+0 .053604
250	23 .760828	23 .755275	+0 .005553
50	23 .760828	23 .734278	+0 .026550

SINCE THE CHRISTIAN ERA.

173	23°.692491	23°.704722	—0°.012231
461	23 .647878	23 .664735	—0 .016415
629	23 .667804	23 .638050	+0 .029754
880	23 .594715	23 .586939	+0 .007776
1000	23 .573889	23 .580567	—0 .006678
1279	23 .534001	23 .539581	—0 .005580
1437	23 .529996	23 .518053	+0 .011943

The whole of these observations fully establish the successive diminution of the obliquity of the ecliptic. Their near coincidence with the numbers deduced from theory, from which they deviate sometimes in excess and sometimes in defect, also shows that this diminution is occasioned solely by the attraction of the planets (particularly of Venus and Jupiter) upon each other, and upon the Earth.

The practical method of ascertaining this diminution is by comparing the positions of the same stars, with respect to the ecliptic, at very distant epochs of time. This difference is the most remarkable in the stars near the summer and winter solstices. Those which were antiently on the north of the ecliptic at the summer solstice, are now removed further

from its plane; and, on the contrary, those stars which, according to the testimony of antient astronomers, were situated on the south of the ecliptic in the vicinity of the same solstice, have approached its plane, and some of them even passed to the north of it. Analogous changes have also taken place with regard to those near the winter solstice. All the stars have likewise participated in this apparent motion; but less in proportion as they are situated nearer the line of the equinoxes, about which they appear to be revolving, as about an axis. It is, therefore, extremely natural to conclude, from these phenomena, that the plane of the ecliptic has really varied its position with respect to the heavens, and produced, in a contrary direction, those appearances which have been observed in the stars; for to suppose that these changes had really taken place in the positions of the stars, would be to attribute an inconceivable agreement to these heavenly bodies.

The young astronomer may find the obliquity of the ecliptic in the following manner:—Near the time of the summer solstice, observe the meridian altitude of the sun's centre for several days together, with the utmost care; and from the greatest of these observed altitudes subtract the height of the equator, and the remaining arc will be the Sun's greatest declination, which being an arc of a great circle, and 90° from each of the equinoctial points, will also be the obliquity of the ecliptic. Or this obliquity may be found by observing the meridian altitude of the Sun's centre on the days of the summer and winter solstice; and the difference of these altitudes will be the distance of the tropics, half of which measures the obliquity of the ecliptic.

But the most important circumstance which theory proves is, that the diminution of the ecliptic will not always be progressive. The time will arrive when the quantity of this diminution will decrease, until it cease entirely, and the obliquity become

stationary. After which, it will increase; and the ecliptic will recede from the equator, in the same manner as it approached it; these alternate states producing perpetual oscillations between fixed limits. These limits, however, have not yet been accurately determined; but, according to the constitution of the planetary system, their existence has been demonstrated, and they are confined within a narrow compass. Hence it may be safely affirmed, contrary to the opinion of the ancients, that the ecliptic never did, nor ever will, coincide with the equator; and this furnishes one among the numerous instances in which the incomprehensible wisdom and goodness of Creative Power are displayed, in providing for the stability of his works.

What has hitherto been observed relates only to the slow and secular diminution of the obliquity of the ecliptic. But this obliquity experiences other small oscillations, which cause it to deviate from its mean value in contrary senses; or so as to be sometimes more than this value, and at others less than it. The most considerable of these oscillations is accomplished in a period of about eighteen years; that is, in that period, all that depends upon this inequality is compensated, and there remains only the general and constant effect of the progressive diminution. The law of these small oscillations has been derived from observation, and theory has explained the cause. These oscillations are produced by the action of the Moon, and constitute part of the phenomena called *nutation*. There is also a small effect of the same kind produced by the Sun; but its quantity is much less, and its period half a tropical year.

We may take this opportunity of observing, that all the elements of the system of the world experience variations like the obliquity of the ecliptic, which are of two kinds; the one, so slow in their progress, that they are only to be ascertained by comparing the ancient observations with the modern. For this reason

they are called *secular inequalities*. The others are more rapid in their march, and return to the same state, after small intervals of time; and astronomers have already observed several of their revolutions. These are called *periodic inequalities*, in order to distinguish them from the preceding, which, though they are periodic, are comprised within limits incomparably more extensive¹.

¹ For the sake of such of our astronomical readers as may wish to see the method of calculating these two kinds of inequalities, we shall here insert the following formulæ, reduced from the *Mécanique Céleste*, tom. iii, page 158. The year 1750 was rendered celebrated by the labours of *Lacaille*, and has, on that account, become the origin of almost all astronomical determinations. The mean obliquity of the ecliptic, or that corrected for all the small periodic oscillations, was then $23^{\circ}.47308$. Let V denote the value of this obliquity, at any number t of Julian years from that epoch; it being negative before and positive after that time. Then the *secular inequality* will be expressed by this formulæ, viz.

$$V = 23^{\circ}.47308 - 0^{\circ}.929736 \sin t \ 32''.11575 - 0^{\circ}.661788 \sin^3 t \ 6''.97323.$$

As $t=0$, at the commencement of the period, or at 1750, all the terms of this formula vanish except the first, which consequently gives the obliquity for that epoch. When t is negative, they all become positive, which shows that the obliquity increases as we ascend from that time; and when t is positive, all the terms except the first are negative, which evidently shows the diminution. Making t equal to unity at any time, and the expression for V will give the annual variation in the mean obliquity at that period.

In order to calculate the *periodic inequalities*, let V be the value of the obliquity at the commencement of any year, and D the actual diminution for that year; V and D being calculated by the preceding formula. Then, after any number of days n has elapsed, the apparent obliquity E will be

$$E = V - \frac{D.n}{365.25} + 0''.43452 \cos 2L + 9''.63199 \cos N.$$

where L is the longitude of the Sun, and N the longitude of the Moon's *ascending node*, or the point where her orbit cuts the ecliptic, as she ascends above this plane towards the north.

The Naturalist's Diary.

The green moss shines with icy glare ;
 The long grass bends its spear-like form ;
 And lovely is the silvery scene
 When faint the sunbeams smile.

Reflection too may love the hour,
 When Nature, hid in Winter's grave,
 No more expands the bursting bud,
 Or bids the flowret bloom.

For Nature soon in Spring's best charms
 Shall rise revived from Winter's grave,
 Again expand the bursting bud,
 And bid the flowret bloom.

SOUTHEY.

IN February, the weather in England is usually variable, but most inclined to frost and snow. The thermometer is often down below the freezing point, but is generally found at noon between 36° and 46° ; towards the end of the month it sometimes rises to 50° , or even 52° or 54° . The severe weather generally breaks up with a sudden thaw, accompanied by wind and rain; torrents of water pour from the hills, and the snow is completely dissolved. Rivers swell and inundate the surrounding country, often carrying away bridges, cattle, mills, gates, &c., and causing great injury to the farmer. But so variable is the weather in this month, that frequently 'frost again usurps the year.'

In the course of this month all nature begins, as it were, to prepare for its revivification. God, as the Psalmist expresses it, 'renews the face of the earth;' and animate and inanimate nature seem to vie with each other in opening the way to spring. About the 4th or 5th, the woodlark (*alauda arborea*), one of our earliest and sweetest songsters, renews his note¹; a

To the WOODLARK.

- ¹ Is it the voice of Winter that I hear
 Hoarse murmuring in the late umbrageous wood?
 Ah! see the blasted products of the year
 Are o'er my path in wild profusion strewed.

week after, rooks begin to pair, and geese (*anas anser*) to lay; the thrush sings; the yellow-hammer is also heard. The chaffinch sings; the green woodpecker (*picus viridis*) makes a loud noise; and the redbreast continues to warble.

A suppliant to your window comes,
Who trusts your faith, and fears no guile;
He claims admittance for your crumbs,
And reads his passport in your smile.

For cold and cheerless is the day,
And he has sought the hedges round;
No berry hangs upon the spray,
Nor worm nor ant-egg can be found.

Secure his suit will be preferred,
No fears his slender feet deter;
For sacred is the household bird
That wears the scarlet stomacher.

CHARLOTTE SMITH.

Turkey-cocks strut and gobble. Partridges (*tetrao perdix*) begin to pair; the house pigeon has young; field crickets open their holes; missel thrushes couple; and wood owls hoot:—gnats play about, and insects swarm under sunny hedges; frogs (*rana temporaria*) croak, and the stone curlew (*otis oedicnemus*) clamours. By the latter end of this month, the raven (*corvus corax*) has generally laid its eggs, and begun to sit. Moles (*talpa europæus*) commence their subterraneous operations.—(See T. T. for 1814, p. 49.)

Adieu, then, loveliest minstrel of the glade!
And farewell all thy melody of song,
Which lately, till th' approach of evening's shade,
Wouldst thou with all thy tuneful art prolong.
Keen penury pursues thy languid wings,
Thy desolate existence to destroy;
And silent as the Muse's golden strings,
Late waked to rapture by their darling boy,
Cold may I find thee on the frost-nipped green,
While tortured I revolve his agonizing scene!

ORAM.

* Chatterton.

The flowers of the crocus (*crocus vernus*) appear, before their leaves are grown to their full length; the barren strawberry (*fragaria sterilis*); the laurustinus (*viburnum tinus*); and the yew-tree (*taxus baccata*), are in flower. The elder-tree (*sambucus nigra*) begins to put forth its flower buds, and the catkins of the hazel are very conspicuous in the hedges. The gooseberry bush (*ribes grossularia*) and the red currant (*ribes rubrum*) show their young leaves about the end of the month.

Many plants appear above ground in February, but few flowers, except the snowdrop, are to be found. This 'icicle changed into a flower' is sometimes fully opened from the beginning of the month.

Now to the wonted church or abbey lone,
In hoary ruin nodding o'er the wood,
The cloister-loving *daw*, returning, breaks
With clamour harsh the still religious scene :
The household *dove* again her task resumes;
Fruitful and patient o'er her snowy eggs
Silent she sits, or steals abroad to peck
The hasty meal, then quick returns to brood
In careful duty, till her partner comes
Exact, with her to share the mutual task :
Ye heedless females ! whom the gadding joys
Of midnight revels, soul-distracting, call
From the endearments of domestic care,
Your honourable pride, observe, with shame,
How nature thus instructing chides neglect.
With sweeping tail, and glossy-swelling breast,
The *powder* struts in amorous fervour proud ;
With scarlet eye, and tremblingly alive,
The *fantail* quivering shakes his silver plumes ;
In dizzy height the *tumbler* sportive rolls ;
The pathless air direct the *carrier* cleaves
With rapid flight, and scorns the world behind,
While from his prison freed, unerring he
O'er hill, o'er dale, pursues his certain track.

BIDLAKE.

The few fine days towards the latter end of this month cannot be more agreeably employed than by cultivating our knowledge of Nature, even in her

minutest works, in the open air. Sir John Hill^a thus describes the interesting results of a morning walk at this season of the year. 'The birds that had been silent for five whole months, now perched on the naked branches of the trees, looked up with a kind of joyful adoration to their enlivening deity, and began to plume themselves in his presence, and try their unaccustomed throats in songs of praise to him: the very boughs on which they stood seemed to disclaim their late dead, withered state; and, swelling out in ten thousand buds, promised soon to meet his radiance with a more cheerful aspect: the little lambs that had hitherto, since their very birth, known no enjoyment beyond the supplying the calls of nature from the cold wet herbage, now seemed to feel new motions in their blood, and new ideas with them, and, by a thousand antic friskings, joined in the general joy.

'I was contemplating all this from the side of the basin, and had afterwards occasionally turned my eye upon the liquid plane, and viewed, through it, the various things it covered: it was somewhat long before this thicker, colder medium transmitted the influence that had invigorated the inhabitants of the air; but by degrees the soul of nature, the Promethean universal fire, made its way through this obstacle.

'It was with infinite satisfaction that I traced the gradation of this pleasing effect: I cast my eye upon the shallow part of the basin, where the fluid was most influenced; the sun darted his glowing beams uninterrupted on this spot, and soon began to triumph in the success of his influence. The smooth surface of the bottom began to elate itself in bubbles, and quickly after to send up parts of its green coat, with every rising bladder of detached air. These were

^a Inspector, No. v, and in *Drake's Gleaner*, vol. ii, p. 26.

continued in long filaments to the surface, where the bubble that had raised them burst its watery shell, and mingled in the common expanse, the fibre which had marked its course remaining, and, with its congenial attendants, forming what the blind naturalist shall investigate as a plant, and trace in it imaginary organs.

‘The real plants, expanded flat upon the level surface, now began to rear their rough leaves, and their numbed branches; they rose to meet the cause of their new life at the surface, and to kindle into genial warmth to propagate their species.

‘The surface of the dusky floor, now naked, exposed more immediately to the influence of this inspiring deity, began soon after to disclose beings of a higher rank; myriads of worms were seen unwinding their coiled forms, and tossing their sportive tails about in wantonness and revelry; whole series of creatures, whose torpid state had before rendered them undistinguishable from the mud they lay among, began to expand their little limbs, and creep or swim, or emerge above the surface.

‘As I was contemplating the opening scene, I could not but persuade myself that the source of the Egyptian enthusiasm, all that had given rise to their fabled stories of the production of animals from the mud of the Nile, was now before me; and I pitied those, who, instead of adoring the First Cause of all things, believed in the mad doctrines of equivocal generation; or, looking up to his great minister the sun, adored the instrument, instead of paying the rational tribute of their praise to him who employed it.

‘As I was ruminating on this, a little creature of a peculiar form and singular beauty rose from the surface of the mud; and soon after began to vibrate its leafy tail, to play the several rings of an elegantly constructed body, and to poise six delicate legs, as if to try whether they were fit for use: numbers of

others followed it, and in a few minutes all that part of the water seemed peopled only by this species.

‘I was ravished with delight at the joy I saw these creatures take in their new animated beings, and was offering an honest silent praise to Him whose unlimited benevolence had created so many happy beings, and who had created them only to be happy; when a hungry fish, allured by the prospect of so full a repast, left his companions, and, throwing himself among the insects, like a ravenous tiger into a sheep-fold, destroyed and gorged them by numbers at a time.

‘Of the multitude that were now scattered to every part of the adjacent space, I luckily cast my eye upon a cluster that had sheltered themselves together under the leaves of a tall plant, part of which was immersed in the water, part emerged above its surface: one of this number, allured by the warm rays, rose higher up the plant, came boldly out of the water, and basked in the more free sunbeams under the open air.

‘The plant was near the shore, and I determined to watch the motions of this little adventurous animal. It had not stood long exposed to the full radiance of the sun, when it seemed on the point of perishing under his too strong heat: its back had suddenly burst open lengthwise; but what was my astonishment, while I was pitying the unhappy insect, to see, as the opening enlarged, a creature wholly unlike the former arising from within it! A very beautiful fly, by degrees, disengaged itself from this reptile case, and left behind it only a thin skin that had been its covering.

‘Such is, undoubtedly, the production of the butterfly from the silk-worm, and from all the caterpillar tribe: the pretended metamorphosis of these creatures is but the child of error and ignorance in the observers; and the caterpillar is no more than the

future fly, covered by a peculiar case, and preserved from injuries in it, till its wings, and every other part of its delicate frame, are in a condition to bear the impulse of the sun and air naked.

‘The new-born inhabitant of the air would now have been suffocated, in an instant, by the element in which it had before so long lived and enjoyed itself: it carefully avoided it; it first tried its newly disentangled legs, and gained by these the summit of the herb—to it, a towering pine: the sun, which at first seemed to create it, in its reptile state, out of the mud, now seemed to enlarge its wings; they unfolded as they dried, and at length showed their silky structure perfect and bright. The creature now began to quiver them in various degrees of elevation and depression, and at length employed them to their destined purpose, launching at once into the sea of air, and sporting in the wide expanse with unrestrained jollity and freedom.’

The husbandman is now eager to commence the work of ploughing, which important business is finished in this month, if the weather permit.

Behind his oxen slow
The patient *ploughman* plods;
And as the sower followed by the clods,
Earth's genial womb receives the swelling seed.
The rains descend, the grains they grow,
And then the vegetable ocean
Rolls its green billows to the April gale.
The ripening gold with multitudinous motion
Sways o'er the summer vale.

SOUTHEY.

In this month, early potatoes are set, hedges repaired, trees lopped, and wet lands drained. Poplars, willows, osiers, and other aquatics, are planted.

Pheasant-shooting usually terminates about the 1st, and partridge-shooting about the 15th, of this month.

MARCH.

AMONG the Romans, March, from Mars, was the first month, and marriages made in this month were accounted unhappy. The Saxons called March *lent-monat*, or *length-moneth*, 'because the days did first begin, in length, to exceed the nights.'

Remarkable Days.

1.—SAINT DAVID.

SAINT David having founded several monasteries, and been the spiritual father of many saints both British and Irish, died about the year 544, at a very advanced age.

Mr. Southey, in his '*Metrical Tales*,' p. 196, has the following pretty tribute to the memory of this Saint, in his '*Inscription for a Monument in the Vale of Ewias* :—

Here was it, stranger, that the *patron Saint*
Of *Cambria* past his age of penitence,
A solitary man; and here he made
His hermitage, the roots his food, his drink
Of Hodney's mountain stream. Perchance thy youth
Has read with eager wonder how the Knight
Of Wales in Ormandine's enchanted bower
Slept the long sleep: and if that in thy veins
Flow the pure blood of Britain, sure that blood
Hath flowed with quicker impulse at the tale
Of DAVID's deeds, when thro' the press of war
His gallant comrades followed his green crest
To conquest. Stranger! Hatterill's mountain heights
And this fair vale of Ewias, and the stream
Of Hodney, to thine after-thoughts will rise
More grateful, thus associate with the name
Of David and the deeds of other days.

The leek worn on this day by Welshmen is said to be in memory of a great victory obtained by them over the Saxons; they, during the battle, having

leeks in their hats, to distinguish themselves, by order of Saint David. Another account adds, that they were fighting under their King Cadwallo, near a field that was replenished with that vegetable.

2.—SAINT CHAD.

Saint *Ceadda* or Chad, educated in the monastery of Lindisfarne, under Saint Aidan, was afterwards Bishop of Lichfield, and died in the great pestilence of 673.

*4. 1461.—EDWARD IV BEGAN TO REIGN.

When Edward ascended the throne, he was one of the handsomest men in England, and perhaps in Europe. His noble mien, his free and easy way, his affable carriage, won the hearts of all at first sight. These qualities gained him esteem and affection, which stood him in great stead in several circumstances of his life. For some time he was exceedingly liberal; but at length he grew covetous, not so much from his natural temper, as out of a necessity to bear the immediate expenses which his pleasures ran him into.

Though he had a great deal of wit, and a sound judgment, he committed several oversights. But the crimes Edward is most justly charged with, are his cruelty, perjury, and incontinence. The first appears in the great number of princes and lords he put to death on the scaffold, after he had taken them in battle. If there ever was reason to show mercy in case of rebellion, it was at that fatal time, when it was almost impossible to stand neuter, and so difficult to choose the justest side between the two houses that were contending for the crown.—*Rapin*.

7.—PERPETUA.

Perpetua, a noble lady of Carthage, only twenty-two years of age, suffered martyrdom in 203, by order of Minutius Firmianus, under the persecution of the Emperor Severus. In the amphitheatre, Perpetua was exposed to the attacks of a wild cow, and, after

being much gored by this animal, she languished for some time under the wounds given her by a young and unskilful gladiator.

***8. 1702.—QUEEN ANNE BEGAN TO REIGN.**

Anne Stuart, Queen of Great Britain, was one of the best and greatest monarchs that ever filled that throne. What was most remarkable, was a clear harmonious voice, always admired in her graceful delivery of her speeches to parliament, insomuch, that it used to be a common saying in the mouth of every one, that ‘her very speech was music.’ Good-nature, the true characteristic of the Stuarts, predominated in her temper, which was a compound of benevolence, generosity, indolence, and timidity, but not without a due sensibility of any slight which she thought was offered to her person or her dignity; to these all her actions, both as a monarch and as a woman, may be ascribed; these were the sources both of her virtues and her failings: her greatest blessing upon earth was that entire union of affections and inclinations between her and her royal consort, which made them a perfect pattern of conjugal love. She was a fond and tender mother, an easy and indulgent mistress, and a most gracious sovereign; but she had more than once reason to repent her giving up her heart, and trusting her secrets without reserve to her favourites. She retained to the last the principle of that true religion which she had imbibed early; being devout without affectation, and charitable without ostentation. She had a great reverence for clergymen eminent for learning and good lives, and was particularly beneficent to the poorer sort of them, of which she left an evidence which bears her name, and will perpetuate both that and her bounty to all succeeding generations.—*Chamberlaine.*

12.—SAINT GREGORY.

Saint Gregory, surnamed the Great, was born about the year 540. He was consecrated Pope about

the year 590, and died in 604. Before his advancement to the see, Gregory projected the conversion of the English nation; and, although his offer to this effect was at first refused, he accomplished his wishes after he assumed the papal chair.

*14. 1803.—KLOPSTOCK DIED.

16.—MIDLENT SUNDAY.

The middle or fourth Sunday in Lent was formerly called the Sunday of the five Loaves, the Sunday of Bread, and the Sunday of Refreshment, in allusion to the gospel appointed for this day. It was also named *Rose-Sunday*, from the pope's carrying a *golden rose* in his hand, which he exhibited to the people in the streets as he went to celebrate the eucharist, and at his return. *Mothering Sunday* is another name attached to this day, from the practice, in Roman Catholic times, of people visiting their *mother-church* on Midlent Sunday. Hence, perhaps, the custom now existing in some parts of England, of children visiting their parents, and presenting them with money, trinkets, or some other trifle. *Furmety* is commonly a rural repast on this day. It is made of whole grains of wheat first parboiled, and then put into and boiled in milk, sweetened, and seasoned with spices.

17.—SAINT PATRICK.

The tutelar saint of Ireland was born in the year 371, in a village called *Bonaven Taberniæ*, probably Kilpatrick, in Scotland, between Dunbriton and Glasgow. Being successively ordained deacon, priest, and bishop, he received the apostolical benediction from Pope Celestine, and was sent by him, about the beginning of the year 432, to preach the gospel in Ireland. He died at the good old age of 123, and was buried at Down, in Ulster.

The *shamrock* is said to be worn by the Irish, upon the anniversary of this saint, for the following reason: When he preached the gospel to the Pagan Irish, he illustrated the doctrine of the Trinity by showing

them a *trefoil*, or three-leaved grass, with one stalk ; which operating to their conviction, the shamrock, which is a bundle of this grass, was ever afterwards worn upon this saint's anniversary, to commemorate the event.—*Brand*.

The Order of St. Patrick was instituted by his present Majesty, in the year 1783.

18.—EDWARD, KING OF THE WEST SAXONS.

He was the son of Edgar, who first united the heptarchy into one kingdom ; after whose death, in the year 975, Edward succeeded to the throne at twelve years of age, but did not enjoy it more than two or three years. Being on a visit to Elfrida, his mother-in-law, at Corfe Castle, in Dorsetshire, he was, by her orders, stabbed in the back while drinking a cup of wine ; that her son Etheldred, his half-brother, might take his place. By the monks this cruel murder has been esteemed a martyrdom, probably on account of this king's attachment to them. The festival was first appointed by Pope Innocent IV, in 1245.

*20. 1727.—SIR ISAAC NEWTON DIED.

Ye mouldering stones,
That build the towering pyramid, the proud
Triumphal arch, the monument effaced
By ruthless ruin, and whate'er supports
The worship name of hoar antiquity,
Down to the dust ! what grandeur can ye boast
While NEWTON lifts his column to the skies,
Beyond the waste of time ? Let no weak drop
Be shed for him. The virgin in her bloom
Cut off, the joyous youth, and darling child,
These are the tombs that claim the tender tear,
And elegiac song. But NEWTON calls
For other notes of gratulation high,
That now he wanders through those endless worlds
He here so well descried, and wondering talks,
And hymns their Author with his glad compeers.

THOMSON.

*21. 1785.—HENRY KIRKE WHITE BORN.

Too, too prophetic did thy wild note swell,
 Impassioned minstrel ! when its pitying wail
 Sighed o'er the vernal primrose as it fell
 Untimely, withered by the northern gale.
 Thou wert that flower of promise and of prime !
 Whose opening bloom, 'mid many an adverse blast,
 Charmed the lone wanderer through this desert clime,
 But charmed him with a rapture soon o'ercast,
 To see thee languish into quick decay.
 Yet was not thy departing immature?
 For ripe in virtue thou wert reft away,
 And pure in spirit, as the blest are pure;
*Pure as the dew-drop, freed from earthly leaven,
 That sparkles, is exhaled, and blends with heaven !*

T. PARK.

21.—SAINT BENEDICT.

Benedict, or *Bennet*, was born at Norcia in Italy, about the year 480, and of an honourable family. Being sent by his parents to Rome to complete his studies, he became disgusted with the licentiousness of the Roman youth, and retired to the mountain of Subiaco, about forty miles from the city. Bennet was now only fifteen, and lived for three years in a cave, Romanus, a monk, giving him provisions : these were let down by a rope, with a bell affixed, to give notice to the holy recluse. Bennet founded the monastery of Casino, in 529 : it was built on the brow of a very high mountain, on the top of which there was an old temple of Apollo, surrounded with a grove. The Benedictine order of monks, first instituted by our saint, was, in the ninth century, at its height of glory.

23.—FIFTH SUNDAY IN LENT.

Dominica in Passione, or Passion Sunday, was the name given to this day in missals ; as the church now began to advert to the sufferings of Christ. In the north, it is called *Carling* Sunday, and grey peas, first steeped a night in water, and fried with butter, form the usual repast.

***24. 1603.—JAMES I BEGAN TO REIGN.**

A king, said James, ought to be a preserver of his people, as well of their fortunes and lives, and not a destroyer of his subjects. Were I to make such a war as the King of France doth, with such tyranny on his own subjects—with Protestants on one side, and his soldiers drawn to slaughter on the other,—I would put myself in a monastery all my days after, and repent me that I had brought my subjects to such misery. Again he says, a king of England has no reason but to seek always to decline a war; for though the sword was, indeed, in his hand, the purse was in the people's. One could not go without the other. Suppose a supply were levied to begin the fray, what certainty could he have that he should not want sufficient to make an honourable end?—See Mr. D'Israeli's *Inquiry into the Literary and Political Character of James I*, an interesting work, in which this peaceful sovereign is vindicated from the unjust aspersions of his various historians.

25.—ANNUNCIATION OF THE B. V. M., or Lady Day.

This day celebrates the angel's message to the Virgin Mary, respecting our Blessed Lord. She was, probably, an only child, and but fifteen years of age when espoused to Joseph. She died A. D. 48, being about sixty years old.

This is one of the four quarter-days, on which rent is paid, &c.

***26. 1812.—EARTHQUAKE AT THE CARACCAS.**

The first commotion took place at five o'clock in the afternoon. The air was calm, the heat excessive: nothing preceded or announced such a catastrophe. A shaking was first perceived, strong enough to set the bells of the church a-ringing: it lasted about six seconds, and was followed by an interval of ten or twelve seconds, during which the earth exhibited an undulation similar to the motion of the sea in a calm: the crisis was then supposed to have passed; but im-

mediately, extraordinary subterraneous noises were heard, and electrical discharges infinitely stronger than atmospheric thunder; the earth was agitated with a quickness which cannot be described, and seemed to boil like water when subjected to the heat of a very strong fire: there was then a perpendicular rumbling or *strepitus* for about three or four seconds, followed by agitations in an opposite direction from north to south, and from east to west, for three or four seconds also. This short but awful period was sufficient to overturn the whole city of Caraccas, with upwards of thirty towns, and the country houses and numerous establishments spread over the surface of that delightful province! In an instant, all was destroyed to an extent of 300 miles, and 80,000 inhabitants ceased to live, while thousands were dreadfully wounded!

*27. 1802.—PEACE OF AMIENS.

*29. 1815.—FRENCH SLAVE TRADE ABOLISHED
BY BONAPARTE.

30.—PALM SUNDAY.

In the missals, this day is denominated *Dominica in ramis Palmarum*, or Palm Sunday, and was so called from the palm branches and green boughs formerly distributed on that day, in commemoration of our Lord's riding to Jerusalem. Sprigs of *box-wood* are still used as a substitute for *palms* in Roman Catholic countries. On this day is still retained the antient usage of decorating churches, houses, &c. with evergreens. The ceremonies of the Greek church, on this occasion, are noticed in T. T. for 1815, p. 85.

Astronomical Occurrences

IN MARCH 1817.

THE Sun enters Aries on the 20th of March, at 54 m. past 10 at night. The following Table shows

his time of rising and setting on every 5th day during the present month.

TABLE
Of the Sun's Rising and Setting for every fifth Day of March 1817.

Saturday, March 1,	Sun rises 35 m. after 6.	Sets 25 m. after 5
Thursday, . . . 6,	. . . 25 . . . 6	. . . 35 . . . 5
Tuesday, . . . 11,	. . . 15 . . . 6	. . . 45 . . . 5
Sunday, . . . 16,	. . . 5 . . . 6	. . . 55 . . . 5
Friday, . . . 21,	. . . 55 . . . 5	. . . 5 . . . 6
Wednesday, . . 26,	. . . 45 . . . 5	. . . 15 . . . 6
Monday, . . . 31,	. . . 35 . . . 5	. . . 25 . . . 6

Equation of Time.

On this subject we must refer our readers to the explanations we have already given in our former volumes, and merely insert in this place the following Table, which shows what is requisite to be added to the time indicated by a good sun-dial, to obtain mean time from apparent.

TABLE
For every fifth Day of the Month.

	m.	s.
March 1, to the time on the dial add	12	41
6,	11	35
11,	10	18
16,	8	54
21,	7	25
26,	5	52
31,	4	19

The sum will be the true time, as given by a well regulated clock.

The Moon will be full at 35 m. after 1 P.M. on the 3d. She will commence her last quarter at 53 m. past 4, on the morning of the 10th; there will be a new Moon on the 17th, at 11 m. after 9 in the evening; and she will enter her first quarter at 2 m. past 2 on the morning of the 26th. The Moon

will also be in conjunction with the star marked β in Scorpio at 29 m. after 9 on the evening of the 8th.

The Moon's passage over the first meridian may be conveniently observed at the following times during this month, viz.

7th day, at 53 m. after 4 in the morning	
8th . . . 52 . . . 5	
24th . . . 30 . . . 6 in the evening	
25th . . . 24 . . . 7	
26th . . . 16 . . . 8	
27th . . . 7 . . . 9	
28th . . . 59 . . . 9	
29th . . . 51 . . . 10	

On the 16th of the present month, Mercury and Saturn will be in conjunction; Mercury being at that time $26\frac{1}{2}$ south of Saturn. Mercury will also attain his greatest elongation on the 7th, and Venus on the 13th. The Georgium Sidus will be in quadrature at 30 m. after 1 P.M. on the 6th; and he will appear stationary on the 21st of this month. Jupiter will also be stationary on the 28th.

Jupiter's first satellite will be visibly eclipsed on the 17th and 24th of this month. The immersion will take place at 19 m. past 2 in the morning of the former day, and at 13 m. after 4 in the morning of the latter. The second satellite will also be eclipsed; immersion on the 22d, at 50 m. after 1 P.M.

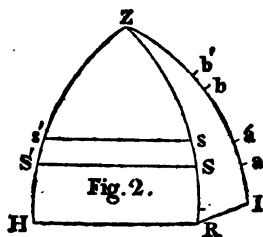
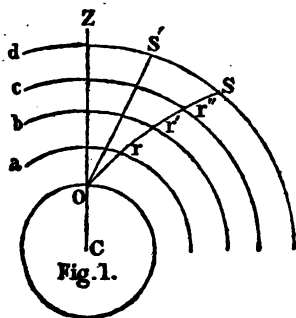
The eclipses of these satellites are calculated for mean time, or that as shown by a true going clock; and those only are noticed above which will be visible at the Royal Observatory and its neighbourhood.

On the Nature and Effects of Refraction.

WHEN the rays of light pass *obliquely* out of one medium into another of a different density, they are bent out of their rectilinear course, and this effect is denominated *Refraction*. This, for instance, takes place when light passes from air into water, from

glass in air, or from one stratum of air into another of different density. Observations on these phenomena have established the following fact: if a luminous ray successively traverse two mediums of the same nature, but of different densities, and, at the point where it passes from the one to the other, a perpendicular to their common surface be drawn, the ray, on passing into the denser medium, approaches this perpendicular; and the sine of the angle of incidence is to the sine of the angle of refraction always in a constant ratio, the densities remaining the same.

The atmosphere being composed of an indefinite number of beds or strata of air, which may be considered as spherical and concentric to each other, and having their density increasing as they approach the earth, the rays of light which traverse these strata pass successively through mediums of different densities, and consequently ought to be inflected towards the earth in proportion as the density increases. This effect will be evident from the following figure;



in which *a*, *b*, *c*, and *d*, represent different concentric beds of the atmosphere, and *r* *r'* *r''* the successive directions which a ray of light assumes in passing through these different strata to arrive at the surface of the earth at *O*.

Now, as the density of the atmosphere at different

altitudes above the earth's surface does not change abruptly, but by insensible degrees, a ray of light in passing through it does not describe a series of right lines, but a curve concave towards the surface of the earth, as represented in the figure. When the ray arrives at the earth's surface, at O, an observer, situated at this point, will receive it according to its last direction OS'; and, as all bodies appear in the directions in which the visual rays reach the observer, the heavenly body S will appear to be at S'. If, in this case, the apparent zenith distance be measured, it will be the angle ZOS' instead of ZOS, which is the true zenith distance. The difference of these two angles, or the angle S'OS, is called the *Astronomical Refraction*; the effect of which is, therefore, to cause all the heavenly bodies to appear more elevated above the horizon than they really are. When the refraction takes place with respect to terrestrial bodies, it is denominated *Terrestrial Refraction*; but as this refraction is neither caused by terrestrial nor celestial bodies, but by the refractive power of the atmosphere, this distinction does not appear to be proper; and it would be more consistent with the phenomena to denominate the whole *Atmospheric Refraction*.

Experience seems to prove that this effect is produced by some kind of action which bodies exercise upon light, analogous to that which chemists call *affinity*. This being the case, at least as to its effects, if we suppose a plane to pass through the centre of all these concentric strata of air, and which is the centre of the earth, and continued to their utmost limits, where the ray first enters the atmosphere, each of these spherical beds will be divided into two equal and symmetrical parts by this plane; and, therefore, there will be an equal attraction on each side, which being exerted in opposite directions, the ray will continue to move in that plane from its first entrance into the atmosphere till it arrive at the eye of the observer. Hence it is concluded, that the

effect of refraction is wholly in a vertical direction, so as to augment the apparent altitudes of all the heavenly bodies, and to diminish their zenith distances.

The effects of refraction, however, are not the same at all altitudes. When rays of light fall perpendicularly on the refracting medium, they do not suffer any refraction; and as the effect of this deflecting power increases with the obliquity of the incident ray, the refraction of the heavenly bodies increases from the zenith, where it is nothing, to the horizon, where it is greatest. Nor are the effects of refraction always the same at equal altitudes; for they vary with both the temperature and pressure of the atmosphere. The limits of this variation are generally between $30'$ and $36'$ of a degree, at the horizon; and these follow nearly the same proportion as far as 8° or 10° of altitude; above which the atmosphere is subject to less changes, and consequently the refraction follows the same rule. The mean horizontal refraction will, therefore, be about $33'$ or $33' 15''$. Hence, refractions are calculated for the *mean* state of the atmosphere, and arranged in tables, according to the apparent altitude of the heavenly bodies, for the use of the practical astronomer; and these are sufficiently accurate for all common purposes; but when great nicety is required they must be corrected for the height of both the barometer and thermometer.

Since refraction increases the apparent altitude of all the celestial bodies, it accelerates their rising, and retards their setting; or, in other terms, it causes them to appear before they actually ascend above the horizon, and to remain in sight after they have really descended below it; and thus adds to the length of the day. Refraction has also an effect in changing the apparent shape of these bodies as well as their places; and it is from this cause that the Sun and full Moon appear of an oval shape at the time of their

rising and setting. The lower limb, or edge, being more refracted than the upper limb, they are, in appearance, brought nearer to each other, and the vertical diameters shortened; and as the horizontal diameter is not shortened in the same proportion, it gives rise to the oval appearance so often observed at those times.

Another effect of refraction is, that of causing two celestial bodies to appear nearer to each other than they really are. Let ZH and ZR (fig. 2, p. 67) be quadrants of two vertical circles, and S, S' any two bodies in these arcs, their true distance SS' will be an arc of a great circle: but as these two bodies are elevated by refraction to s and s' , their apparent distance will consequently be ss' , which is evidently less than their true distance SS' ; because the two verticals approach each other, and meet at the zenith Z . If the altitudes of both bodies be the same, and the refraction known, by subtracting it from the apparent altitudes, the true altitudes SR and $S'H$ will be obtained, and then the true distance of the two bodies can easily be found by proportion. For in the spherical triangles Zss' and ZSS' , as the sine of Zs the apparent zenith distance: the sine of ZS the true zenith distance :: ss' the apparent distance between the two bodies: SS' their real distance. When the apparent altitudes of the two bodies are different, then, in the same triangle Zss' , the two complements Zs and Zs' of the apparent altitudes, and the apparent distance ss' , are known, from which the angle Z can be found by the common principles of spherical trigonometry. Then by adding the refraction to the complements of the altitudes, the two sides ZS and ZS' , and the angle Z of the triangle ZSS' , will be given to find the true distance SS' .

Again, if the two bodies be on the same vertical ZI , as at a and b , the effect of refraction will cause them to appear at a' and b' ; then, since refraction is the greatest at the least altitude, the body at a will

be more elevated by it than that at b , and consequently the apparent distance $a'b'$ will be less than the true distance ab ; and their difference will be equal to the difference of the refractions at the apparent altitudes a' and b' .

The following easy and practical methods of ascertaining the refraction are presented to the attention of the young astronomer. Observe the altitude of the Sun or a star, the right ascension and declination of which are known; and, by means of a good watch, or a chronometer, find the exact time between the moment of observing the altitude and the time of the Sun or star's passing the meridian; from which the horary angle is easily obtained by saying, as 1 hour : the observed time :: 15° : the degrees in the required angle. Then, having the complement of the latitude, the complement of the Sun or star's declination, and the horary angle, the complement of the altitude may easily be found by the common principles of spherical trigonometry; and the difference between the observed and the calculated altitude will be the refraction required. This method was put in practice by M. Cassini, when he observed the altitude of the Sun's centre at 20 m. past 5 on the morning of the 1st of May 1738, in latitude $48^\circ 50' 10''$ N., and found it to be $5^\circ 0' 14''$; from which he deduced the refraction at that altitude equal to $10' 30''$.

Another method of finding the refraction is, by taking the greatest and least altitudes of some circumpolar star, which passes the upper part of the meridian near the zenith, and consequently is at that time nearly free from refraction. Then, having the latitude of the place of observation, the apparent distance of the star from the pole, at each observation, will be known; and the less of these distances taken from the greater will give the refraction at the least altitude. M. de la Caille employed this method in ob-

serving a star to pass the meridian of Paris within 6' of the zenith; and, when it passed the lower part of the meridian, its altitude was $7^{\circ} 52' 25''$. The altitude, as deduced from the polar distance, he found to be $7^{\circ} 46' 20''$; and consequently the refraction at the apparent altitude of $7^{\circ} 52' 25''$ was $6' 5''$, according to his determination.

Both these methods, however, serve rather for verifying the refraction than for finding it in the first instance, as they require the latitude of the place of observation to be known, which can only be accurately ascertained *after* the refraction has been correctly determined.

When the refraction has been found for a few apparent altitudes, it then becomes desirable to ascertain the law of its variation, in order to adapt it to all other altitudes.

The celebrated astronomer, Dr. Bradley, gave the following simple and general rule for finding the refraction r at any altitude a ; viz. as radius $1 : \cotang. (a + 3r) :: 57'' : r$; which expresses the refraction in seconds, agreeing very nearly with observations made at a mean state of the barometer and thermometer. This formula has likewise been improved in point of accuracy by the labours of later astronomers; but it has at the same time been rendered more complicated.

The following general rule for finding the refraction, answering to any observed altitude, has been deduced from the formulæ given by Laplace, in his celebrated work the *Mécanique Céleste*, viz:—

1. Add the logarithmic cotangent of the observed altitude to -2.8230506 , and the sum will be the log. tangent of an arc.

2. Add the log. tangent of half this arc to -2.5225024 , and the sum will be the log. tang. of a second arc, which is to be reduced into seconds.

3. Then to the log. of this number of seconds,

add — 1.4003208, and the sum will be the log. of the number of seconds in the required refraction ².)

The Naturalist's Diary.

In mantle of Proteus clad,
With aspect ferocious and wild;
Now pleasant, now sullen and sad,
Now froward, now placid and mild.

SUCH is the poet's character of this month, which is, in general, cold, with keen winds, the air clear and

² The *formule*, from which the above rule is immediately derived, are the following:—

$$\text{tang. } u = \sin. 2nR \cdot \text{tang. } z.$$

$$\text{and tang. } nr = \text{tang. } nR \cdot \text{tang. } \frac{1}{2} u;$$

where $n = 3.78$, $nR = 6867''$, and z = the observed zenith distance.

But as these formulæ are adapted to the medium pressure of the atmosphere at the level of the sea, or 29.92 inches, and 32° of Fahrenheit's thermometer, the latter formula requires a reduction to bring it to the mean temperature, which should be about 57°.2 of Fahrenheit's scale. In this case, if d be put for the number of degrees between the freezing point and the given temperature, the last of the above formulæ becomes

$$\text{tang. } (1.00208 \, dnr) = \text{tang. } nR \cdot \text{tang. } \frac{1}{2} u.$$

The following example will be of service to the young student in illustrating the preceding rule.

To find the refraction answering to 30° of observed altitude:—

$$1\text{st.}—\text{Log. cotan. } 30^\circ = 10.2385606$$

$$\text{add — } 2.8230506$$

$$\text{Sum—tang. } u = 6^\circ 34' 22'' = 9.0010112$$

$$2\text{d.}—\text{Log. tang. } \frac{1}{2} u = 3^\circ 17' 11'' = 8.7590721$$

$$\text{add — } 2.5225024$$

$$\text{Tang. } 6' 34''.5 = 394''.5 = 7.2815745$$

$$3\text{d.}—\text{Then log. } 394''.5 = 2.5960475$$

$$\text{add — } 1.4003208$$

$$\text{Refrac.} = 1' 39'' = 99''.167 = 1.9963678$$

healthy. The superabundant moisture of the earth is dried up, and the process of vegetation is gradually brought on; those trees which, in the last month, were budding, now begin to put forth their leaves. The latest springs are always the most favourable, because, as the young buds do not appear so soon, they are not liable to be cut off by chilling blasts. Often may we say with the poet, in this and the following month,

Thou lingerest, SPRING! still wintry is the scene,
 The fields their dead and sapless russet wear;
 Scarce does the glossy *pile-wort* yet appear
 Starring the sunny bank, or early green
 The *elder* yet its circling tufts put forth.
 The *sparrow* tenants still the eaves-built nest,
 Where we should see our *martins'* snowy breast
 Oft darting out. The blasts from the bleak north
 And from the keener east still frequent blow.
 SWEET SPRING, thou lingerest! and it should be so;
 Late let the fields and gardens blossom out!
 Like MAN when most with smiles thy face is drest,
 'Tis to deceive, and he who knows ye best,
 When most ye promise, ever most must doubt¹.

The melody of birds now gradually swells upon the ear. The thristle (*turdus musicus*), second only to the nightingale in song, charms us with the sweetness and variety of its lays. This bold and pleasing songster, from his high station, seems to command the concert of the grove, while, in the language of the poet,

The jay, the rook, the daw,
 And each harsh pipe (discordant heard alone)
 Aid the full concert, while the stock-dove breathes
 A melancholy murmur through the whole.

The linnet and the goldfinch join the general concert in this month, and the golden-crowned wren (*motacilla regulus*) begins its song. Rooks build and repair their nests. Rooks, crows, and pigeons, it has been proved, are by no means so detrimental to the

¹ Southey's Metrical Tales, &c. p. 114.

farmer as is generally imagined, though many of them still commit great havoc among these birds, and use every means in their power to frighten them away. (See T. T. for 1816, pp. 86, 87.)

To the Crow.

Say, weary bird, whose level flight
Thus, at the dusky hour of night,
Tends thro' the midway air,
Why yet beyond the verge of day
Is lengthened out thy dark delay,
Adding another to the hours of care?

The wren within her mossy nest
Has hushed her little brood to rest;
The wood-wild pigeon, rocked on high,
Has cooed his last soft note of love,
And fondly nestles by his dove,
To guard their downy young from an inclement sky.

Each twittering bill and busy wing,
That flits thro' morning's humid spring,
Is still—list'ning perhaps so late
To *Philomel's* enchanting lay,
Who now, ashamed to sing by day,
Trills the sweet sorrows of her fate.

Haste, bird, and nurse thy callow brood,
They call on Heaven and thee for food,
Bleak—on some cliff's neglected tree;
Haste, weary bird, thy lagging flight—
It is the chilling hour of night;
Fit hour of rest for thee!

Those birds which have passed the winter in England now take their departure for more northerly regions. The fieldfares (*turdus pilaris*) travel to Russia, Sweden, and Norway, and even as far as Siberia. They do not arrive in France till December, when they assemble in large flocks of two or three thousand. The red-wing (*turdus iliacus*), which frequents the same places, eats the same food, and is very similar in manners to the fieldfare, also takes leave of this country for the season. Soon after, the woodcock

* The Wiccamical Chaplet, 1806.

(*scolopax rusticola*) wings its aerial voyage to the countries bordering on the Baltic. Some other birds, as the crane and stork, formerly natives of this island, have quitted it entirely, since our cultivation and population have so rapidly increased.

Among the numerous songsters of this month, we must not omit to name the

Early, cheerful, mounting lark,
Light's gentle usher, Morning's clerk,
In merry notes delighting,

and 'bearing up its hymn to heaven.' The skylark commonly forms its nest between two clods of earth, and lines it with dried grass and roots. In this she lays four or five eggs, and her period of incubation is about a fortnight, which office she generally performs twice a year. Her maternal affection is extremely interesting, both to the eye and to the heart. When her young are callow, she may be seen fluttering over their heads, directing their motions, anticipating their wants, and guarding them against the approach of danger.

The instinctive attachment, indeed, of the female skylark to her offspring, often precedes the period when she is capable of being a mother. 'A young hen bird,' says Buffon, 'was brought to me in the month of May, which was not able to feed without assistance. I caused her to be educated; and she was hardly fledged when I received from another place a nest of three or four callow skylarks. To these strangers she contracted a strong liking; she attended them night and day, though nearly as old as herself, cherished them beneath her wings, and fed them with her bill. Nothing could interrupt her tender offices. If the objects of her regard were torn from her, she flew back to them as soon as she was liberated, and disdained to think of effecting her own escape, which she had frequent opportunities of doing, while they remained in confinement. Her affection seemed to deprive her of every concern for self preser-

vation; she neglected food and drink, and though now supplied the same as her adopted offspring, she expired at last, quite worn out with maternal solicitude. None of the young ones long survived her, but died one after another; so essential were her cares, which were equally tender and judicious to their preservation.'

The melody of the lark continues during the whole of the summer. It is chiefly, however, in the morning and evening that its strains are heard; and as it chaunts its mellow notes on the wing, it is the peculiar favourite of every person who has taste to relish the beauties of nature, at the most tranquil seasons of the day, particularly at dawn, when he 'warbles high'

His trembling—thrilling—ecstasy;
And lessening from the dazzled sight,
Melts into air and liquid light.

The lark mounts almost perpendicularly, and by successive springs, into the air, where it frequently hovers over its nest, and the objects of its dearest affections, at a vast height, without once losing sight of them. Its descent is in an oblique direction, unless when it is alarmed or attracted by its mate, when it drops to the earth like a stone.

So the sweet lark, high poised in air,
Shuts close his pinions to his breast,
If chance his mate's shrill call he hear,
And drops at once into her nest.

When it begins to rise, its notes are feeble and interrupted; but they gradually swell, as it ascends, to their full tone, and delight every ear that is enamoured of nature.

For nearly three months before Christmas, larks lose their voice, begin to assemble in flocks, grow fat, and are taken in prodigious numbers by the bird-catchers. As many as four thousand dozen have been caught in the vicinity of Dunstable alone, between September and February; nor are they less an

While on that dewy cloud so high,
 The lark, sweet minstrel of the sky,
 Sings in the morning's beamy eye,
 And bathes his spotted breast.

CHARLOTTE SMITH.

Frogs, enlivened by the warmth of spring, rise from the bottom of ponds and ditches, where they have lain torpid during the winter. The smelt (*salmo eperlanus*) begins to ascend rivers to spawn, when they are taken in great abundance.

On the 20th, the vernal equinox takes place. All Nature feels her renovating sway, and seems to rejoice at the retreat of winter. The willow (*salix*) now enlivens the hedges; the aspen (*populus tremula*), and the alder (*alnus betula*), have their flowers full blown; the laurustinus (*viburnum tinus*) and the bay (*laurus nobilis*) begin to open their leaves. The equinoctial gales are usually most felt, both by sea and land, about this time.

Our gardens begin now to assume somewhat of a cheerful appearance. Crocuses, exhibiting a rich mixture of yellow and purple, ornament the borders; mezzereon is in all its beauty; the little flowers 'with silver crest and golden eye,' the daisies, are scattered over dry pastures; and the pilewort (*ranunculus ficaria*) is seen on the moist banks of ditches. The primrose too (*primula veris*) peeps from beneath the hedge.

A thousand bills are busy now; the skies
 Are winnowed by a thousand fluttering wings,
 While all the feathered race their annual rites
 Ardent begin, and choose where best to build
 With more than human skill; some cautious seek
 Sequestered spots, while some more confident
 Scarce ask a covert. Wiser, these elude
 The foes that prey upon their several kinds;
 Those to the hedge repair with velvet down
 Of budding willows, beautifully white.
 The cavern-loving wren sequestered seeks
 The verdant shelter of the hollow stump,
 And with congenial moss, harmless deceit,
 Constructs a safe abode. On topmost boughs

The glossy *raven*, and the hoarse-voiced *crow*,
 Rocked by the storm, erect their airy nests.
 The *ousel*, lone frequenter of the grove
 Of fragrant pines, in solemn depth of shade
 Finds rest; or 'mid the holly's shining leaves,
 A simple bush the piping *thrush* contents,
 Though in the woodland concert he aloft
 Trills from his spotted throat a powerful strain,
 And scorns the humbler quire. The *lark* too asks
 A lowly dwelling, hid beneath a turf,
 Or hollow, trodden by the sinking hoof;
 Songster of heaven! who to the sun such lays
 Pours forth, as earth ne'er owns. Within the hedge
 The *sparrow* lays her sky-stained eggs. The barn,
 With eaves o'er pendant, holds the chattering tribe:
 Secret the *linnet* seeks the tangled copse:
 The white *owl* seeks some antique ruined wall,
 Fearless of rapine; or in hollow trees
 Which age has caverned, safely courts repose:
 The thievish *pie* in twofold colours clad,
 Roofs o'er her curious nest with firm-wreathed twigs,
 And sidelong forms her cautious door; she dreads
 The taloned *kite*, or pouncing *hawk*; savage
 Herself;—with craft suspicion ever dwells.

BIDLAKE.

The leaves of honeysuckles are now nearly expanded; in our gardens, the buds of the cherry-tree (*prunus cerasus*), the peach (*amygdalus persica*), the nectarine, the apricot, and the almond (*prunus armeniaca*), are fully opened in this month. Virgil makes the flowering of the almond a sign of the crop of wheat, (Georg. I, v. 187.)

With many a bud, if flow'ring *almonds* bloom,
 And arch their gay festoons that breathe perfume,
 So shall thy harvest like profusion yield,
 And cloudless suns mature the fertile field:
 But if the branch, in pomp of leaf arrayed,
 Diffuse a vain exuberance of shade,
 So fails the promise of th' expected year,
 And chaff and straw defraud the golden ear.

SOTHEBY.

The buds of the hawthorn (*crataegus oxyantha*)

and of the larch-tree (*pinus larix*) begin to open; and the tansy (*tanacetum vulgare*) emerges out of the ground; ivy-berries are ripe; the daffodil (*pseudonarcissus*) in moist thickets, the rush (*juncus pilosus*), and the spurge laurel (*daphne laureola*), found in woods, are now in bloom. The common whitlow grass (*draba verna*) on old walls; the yellow Alpine whitlow grass (*draba aizoides*) on maritime rocks; and the mountain pepper-wort (*lepidum petræum*) among limestone rocks, flower in March.

The sweet violet (*viola odorata*) sheds its delicious perfumes in this month.

Though the striped *tulip*, and the blushing *rose*,
The *polyanthus* broad, with golden eye,
The full *carnation*, and the *lily* tall,
Display their beauties on the gay parterre,
In costly gardens, where th' unlicensed feet
Of rustics tread not; yet that lavish hand,
Which scatters VIOLETS under every thorn,
Forbids that sweets like these should be confined
Within the limits of the rich man's wall².

The gannets, or Soland geese (*pelicanus bassanus*), resort in March to the Hebrides, and other rocky isles of North Britain, to make their nests, and lay their eggs.

Much amusement may be derived in this month, as well as in the last, from watching the progress of worms, insects, &c., from torpidity to life, parti-

- 2 To ———,

Wrapped round a Nosegay of Violets.

Dear object of my late and early prayer!
Source of my joy, and solace of my care!
Whose gentle friendship such a charm can give,
As makes me wish, and tells me how, to live!
To thee the Muse with grateful hand would bring
These first fair children of the doubtful spring.
O may they, fearless of a varying sky,
Bloom on thy breast, and smile beneath thine eye;
In fairer lights their vivid blue display,
And sweeter breathe their little lives away!

LANGHORNE.

cularly on the edges or banks of ponds.—See our Diary for February.

Towards the close of the month, bees (*apis mellifica*) venture out of their hives. Some notice has been taken of this interesting insect in our former volumes; we shall now pursue the subject. The bee is the most active and the most industrious of all insects. It works from the very first ray of day to the twilight, in those countries in which there is a perpetual spring. In the southern countries it is occupied during nine months; there is even in the winter but a few days in which it appears to repose. It is only in the more northern countries that the bee ceases absolutely to collect its sweets, from the latter end of September until the return of spring.

It is to this insect, and to this only, that we are indebted in Europe for the honey and the wax, which form an important branch of our rural economy; it gathers the substances which form the composition of honey from the majority of the plants, from the loftiest tree to the most humble of the shrubs and simples. The forests and the heaths belong equally to its domain.

Indeed, during the time of the rising of the sap, all the vegetables are full of nutritious juices, which are laid under contribution by the bee, whose only embarrassment is in the selection. Independently of the juice of the plants, and the nectar of the flowers, which it extracts from their chalice, without tarnishing their purity, and with an art which is derivable solely from nature, it is often observed to be busily occupied with bark and moss of trees, on which its piercing eye, and penetrating sense and smell, have enabled it to discover those substances which are necessary to the completion of its mellifluous store: it is sometimes seen on rocks, and on walls, the stones of which appear to be completely bare. This insect appears to collect salts which are wholly imperceptible to us. Water is actually necessary to it, and its

instinct enables it to discover springs which to us are unknown.

The bee is particularly delighted in roaming from flower to flower; and if it does not insert its whole body into each, it at least introduces its proboscis into the chalice. It enriches itself from every flower, and the attentive eye of the observer, who watches its motions, perceives the growth of the pellets of pollen, or farina, with which it furnishes the cavities of its hinder legs. But the eye cannot perceive any alteration in the flowers; they have not lost any thing of their beauty, nor of their colours, nor of their faculty of fructification; on the contrary, it is by the bee that the pollen of the male flower is conveyed to the female, as in cucumbers, melons, currants, gooseberries, &c.

During the summer, to whatever quarter the bee directs its flight, it is certain of a greater or less harvest of those substances which are proper for its habitation and support. With these substances imbibed into the stomach, or fixed to its thighs, back, or wings, it continues its flight in search of more food; and such is its indefatigability and ardour, that it prolongs its flight until its load be perfectly complete, with which it returns to the hive.

Immediately on its arrival, it hastens to a cell, and evacuates from its stomach the substance which is converted into honey, or it is assisted by the other bees in discharging from its thighs the load of farina which it has collected in its journey. It is no sooner unburthened of its treasure, than it prepares for a fresh flight, cleans its wings, refreshes its antennæ, and in an instant darts from the hive to the fields of its harvest.

The bees live in a state of society; the individuals of a hive are perfectly known to each other, and they never admit a stranger into their community, excepting accidentally at swarming time, when circumstances can so combine, that several swarms may

unite, and form a social brotherhood. Every society is a monarchy governed by a queen, subordinate to whom are several hundred drones, and a multitude of labourers, according to the size of the colony¹.

The queen insect is renowned for her splendour and beauty; her influence extends far and near among the little busy industrious tribes, who are patterns of neatness and activity.

But mark, of regal port and awful mien,
Where moves with measured pace the *Insect Queen*!
Twelve chosen guards, with slow and solemn gait,
Bend at her nod, and round her person wait;
Not eastern despots, of their splendour vain,
Can boast in all their pomp a brighter train
Of fear-bound satraps; not in bonds of love
Can loyal Britons more obedient move,
Whose patriot king an heartfelt homage finds,
And guides with easy rein their willing minds;
The pregnant *Queen* her duteous slaves attend,
With plausible air the high-arched dome ascend,
Cling in fond rapture round the genial bed,
And o'er her form a living curtain spread.

When twice ten suns, with all resplendent ray,
Have shed soft radiance on the brow of May,
The royal nymph to light exulting springs,
And gayly trims her short but sinewy wings:
Long is her tapering form, and fringed with gold
The glossy black which stains each scaly fold;
With gold her cuirass gleams, and round her thighs
The golden greaves in swelling circles rise:
Full armed the monarch soars on sounding wing,
But mildly shields her formidable sting!

DR. EVANS'S BEES, a Poem.

In the latter end of March, chickens run about; a brimstone-coloured butterfly (*papilio rhamni*) appears²; sea-kale begins to sprout; black beetles fly

¹ See Mr. Huish's entertaining and instructive Treatise on Bees, p. 11—13.

² Child of the sun! pursue thy rapturous flight,
Mingling with her thou lov'st in fields of light;
And, where the flowers of paradise unfold,
Quaff fragrant nectar from their cups of gold.

about in the evening; and bats issue from their places of concealment. Roach and dace float near the surface of the water, and sport about in pursuit of insects. Daffodils are in flower; peas appear above ground, and the male blossoms of the yew-tree expand and discharge their farina. Sparrows are busily employed in forming their nests. Young lambs are weaned this month.

In this month the farmer dresses and rolls his meadows; spreads ant-hills; plants quicksets, osiers, &c.; sows flax seed, artificial grasses, beans and peas, broom and whin seeds, and grass seeds among wheat. About the 23d, he ploughs for and sows oats, and hemp, and flax. A dry season is very important to the farmer, that he may get the seed early into the ground.

In our last year's Diary for March, we gave the Rev. R. Polwhele's pleasing Poetical Calendar of Nature for that month, adapted to the SW. districts of England; we shall conclude the present with a beautiful '*Elegy on the Approach of Spring*,' by John Scott, of Amwell.

Stern Winter hence with all his train removes,
And cheerful skies and limpid streams are seen;
Thick-sprouting foliage decorates the groves;
Reviving herbage clothes the fields with green.

Yet lovelier scenes th' approaching months prepare;
Kind Spring's full bounty soon will be displayed;
The smile of beauty every vale shall wear;
The voice of song enliven every shade.

O Fancy, paint not coming days too fair!
Oft for the prospects sprightly May should yield,

There shall thy wings, rich as an evening sky,
Expand and shut with silent ecstasy!
—Yet wert thou once a worm, a thing that crept
On the bare earth, then wrought a tomb and slept!
And such is man; soon from his cell of clay
To burst a seraph in the blaze of day!

ROGERS.

Rain-pouring clouds have darkened all the air,
Or snows untimely whitened o'er the field :

But should kind Spring her wonted bounty show'r,
The smile of beauty, and the voice of song ;
If gloomy thought the human mind o'erpow'r,
Ev'n vernal hours glide unenjoyed along.

I shun the scenes where maddening passion raves,
Where Pride and Folly high dominion hold,
And unrelenting Avarice drives her slaves
O'er prostrate Virtue in pursuit of gold.

The grassy lane, the wood-surrounded field,
The rude stone fence with fragrant wall-flowers gay,
The clay-built cot, to me more pleasure yield
Than all the pomp imperial domes display :

And yet ev'n here, amid these secret shades,
These simple scenes of unreprieved delight,
Affliction's iron hand my breast invades,
And Death's dread dart is ever in my sight.

While genial suns to genial showers succeed,
(The air all mildness, and the earth all bloom);
While herds and flocks range sportive o'er the mead,
Crop the sweet herb, and snuff the rich perfume ;

O why alone to hapless man denied
To taste the bliss inferior beings boast ?
O why this fate, that fear and pain divide
His few short hours on earth's delightful coast ?

Ah cease—no more of Providence complain !
Tis sense of guilt that wakes the mind to woe,
Gives force to fear, adds energy to pain,
And palls each joy by Heaven indulged below :

Why else the smiling infant-train so blessed,
Ere ill propension ripens into sin,
Ere wild desire inflames the youthful breast,
And dear-bought knowledge ends the peace within ?

As to the bleating tenants of the field,
As to the sportive warblers on the trees,
To them their joys sincere the seasons yield,
And all their days and all their prospects please.

Such mine, when first, from London's crowded streets,
Roved my young steps to Surry's wood-crowned hills,
O'er new blown meads, that breathed a thousand sweets,
By shady coverts and by crystal rills.

O happy hours, beyond recovery fled !
 What share I now that can your loss repay,
 While o'er my mind these glooms of thought are spread,
 And veil the light of life's meridian ray?

Is there no Power this darkness to remove?
 The long-lost joys of Eden to restore?
 Or raise our views to happier seats above,
 Where fear and pain and death shall be no more?

Yes, those there are who know a Saviour's love
 The long-lost joys of Eden can restore,
 And raise their views to happier seats above,
 Where fear and pain and death shall be no more:

These, grateful, share the gifts of Nature's hand;
 And in the varied scenes that round them shine
 (Minute and beautiful, or rude and grand),
 Admire th' amazing workmanship divine.

Blows not a floweret in th' enamelled vale,
 Shines not a pebble where the rivulet strays,
 Sports not an insect on the spicy gale,
 But claims their wonder and excites their praise.

From them ev'n vernal Nature looks more gay,
 For them more lively hues the fields adorn;
 To them more fair the fairest smile of Day,
 To them more sweet the sweetest breath of Morn.

They feel the bliss that Hope and Faith supply;
 They pass serene th' appointed hours that bring
 The Day that wafts them to the realms on high,
 The Day that centres in Eternal Spring.

APRIL.

APRIL is derived from *Aprilis*, of *aperio*, I open; because the earth, in this month, begins to open her bosom for the production of vegetables. The Saxons called this month *oster-monat*, from the goddess Goster, or because the winds were found to blow generally from the east in this month.

Remarkable Days.

1.—ALL FOOLS' DAY.

ON this day every body strives to make as many fools as he can: the wit chiefly consists in sending persons on what are called sleeveless errands, for the *history of Eve's mother*, for *pigeon's milk*, *stirrup oil*, and similar ridiculous absurdities. Some curious particulars of this day, also, may be seen in T.T. for 1815, pp. 118-121.

3.—MAUNDY THURSDAY.

This day is called in Latin *Dies Mandati*, the day of the command, being the day on which our Lord washed the feet of his disciples, as recorded in the second lesson. This practice was long kept up in the monasteries. After the ceremony, liberal donations were made to the poor, of clothing and of silver money, and refreshment was given them to mitigate the severity of the fast. On the 15th April, 1731 (Maundy Thursday), the *Archbishop of York* washed the feet of a certain number of poor persons. James II was the last king who performed this in person. A relic of this custom is still preserved in the donations dispensed at St. James's on this day.—See T.T. for 1815, p. 86, where the ceremonies at Rome and Moscow, on this day, are also described.

3.—RICHARD, *Bishop*.

Richard, surnamed *de Wicke*, from a place in Worcestershire, where he was born, was educated at the Universities of Oxford and Paris. He was as remarkable for his learning and diligence in preaching, as he was for integrity. Richard was canonized by Pope Urban.

4.—GOOD FRIDAY.

This day commemorates the sufferings of Christ, as a propitiation for our sins. Holy Friday, or the Friday in Holy Week, was its most antient and general appellation; the name Good Friday is peculiar

to the English church. It was observed as a day of extraordinary devotion. Buns, with crosses upon them, are usually eaten in London and some other places, on this day, at breakfast. St. Peter's church at Rome is most superbly illuminated on this night. —See T. T. for 1815, p. 88 ; and, respecting cross-buns, p. 89.

The procession, on this day, at Barcelona, is thus described by the Rev. Joseph Townsend, in his 'Journey through Spain,' vol. i, pp. 107-110, 8vo edit. 'In every church (says he) I found two images, as large as life, distinguished from the rest as being stationary, and the more immediate objects of their devotion ; the one representing Christ as taken from the cross, the other the Virgin in all her best attire, pierced by seven swords, and leaning over the recumbent body of her son. Behind these images, a theatre with colonnades, supporting a multitude of wax tapers, dazzled the sight, while the ear was charmed by the harmonious chaunting of the choir.

'More than a hundred thousand persons all the morning crowded the streets, hurrying from church to church to express the warmth of their zeal, and the fervour of their devotion, by bowing themselves in each, and kissing the feet of the most revered image. Most of the spectators were natives of the city, but many upon such occasions resort to Barcelona from the adjacent villages, and some from distant provinces.

'Towards the close of day the pageant appeared, moving with slow and solemn pace along the streets, and conducted with the most perfect regularity. The last supper of Christ with his disciples, the treachery of Judas, attended by the priests, together with the guards, the flagellation, the crucifixion, the taking from the cross, the anointing of the body, and the burial, with every transaction of the closing scene, and the events subsequent to the passion of our Lord, were represented by images as large as life, placed

in proper order on lofty stages, many of which were elegant, and all as highly ornamented as carving and gilding, rich silks, brocades, and velvets, with curious embroidery, all executed by their most skilful artists, could render them. No expense was spared either in the materials, the workmanship, or the wax lights, which, with the most splendid profusion, were consumed upon this occasion. Each of these stages was supported on the shoulders of six men, who were completely hid by a covering of black velvet hanging round the margin of the stage, and reaching nearly to the ground. This procession was preceded by Roman centurions clothed in their proper armour, and the soldiers of the garrison brought up the rear. The intermediate space was occupied by the groups of images above described, attended by eight hundred burgesses, clothed in black buckram, with flowing trains, each carrying a flambeau in his hand. Besides these, one hundred and fourscore penitents engaged my more particular attention. Like the former, they carried each a flambeau, but their dress was singular, somewhat resembling that of the blue-coat boys of Christ's hospital in London, being a jacket and coat in one, reaching to their heels, made of dark brown shalloon, with a bonnet on their head, like what is called a fool's cap, being a cone covering the head and face completely, and having holes for the eyes. The design of this peculiar form is to conceal the penitents, and to spare their blushes. These were followed by twenty others, who, either from remorse of conscience, or having been guilty of more atrocious crimes, or for hire, or with the most benevolent intention of adding to the common fund of merit for the service of the church, walked in the procession barefooted, dragging heavy chains, and bearing large crosses on their shoulders. Their penance was severe; but, for their comfort, they had assigned to them the post of honour; for immediately after them followed the sacred corpse placed

in a glass coffin, and attended by twenty-five priests, dressed in their richest robes. Near the body a well chosen band with hautboys, clarinets, French horns, and flutes, played the softest and most solemn music. This part of the procession wanted nothing to heighten the effect. I am persuaded that every one who had a soul for harmony felt the starting tear.'

—

His SAVIOUR'S WORDS going to the CROSS.

Have, have ye no regard, all ye
Who pass this way, to pity me,
Who am a man of misery ?

A man both bruised, and broke ; and one
Who suffers not here for mine own,
But for my friends' transgression !

Ab, Sion's daughters ! do not fear
The cross, the cords, the nails, the spear,
The myrrh, the gall, the vinegar ;

For Christ, your loving Saviour, hath
Drunk up the wine of God's fierce wrath ;
Only there's left a little froth,

Less for to taste, than for to shew
What bitter cups had been your due,
Had he not drunk them up for you.

HERRICK.

4.—SAINT AMBROSE.

Our saint was born about the year 340, and was educated in his father's palace, who was Prætorian Præfect of Gaul. He ruled over the see of Milan with great piety and vigilance for more than twenty years ; during which time, he gave all his money to pious uses, and settled the reversion of his estate upon the church. He converted the celebrated St. Augustine to the faith, and at his baptism, in a miraculous manner, composed that divine hymn, so well known in the church by the name of *Te Deum*. He died, aged fifty-seven, in the year of our Lord 396.

***4. 1774.—OLIVER GOLDSMITH DIED.**

Thou seest the tomb of OLIVER; retire,
 Unholy feet, nor o'er his ashes tread.
 Ye whom the deeds of old, verse, nature, fire,
 Mourn Nature's priest, the bard, historian, dead.

JOHNSON.

5.—EASTER-EVE.

Particular mortifications were enjoined to the earliest Christians on this day. From the third century, the fast was indispensable and rigid, being protracted always to midnight, sometimes to the cock-crowing, and sometimes to the dawn of Easter-day; and the whole of the day and night was employed in religious affairs.

5. 1753.—BRITISH MUSEUM FOUNDED.**5. 1800.—REV. W. MASON DIED.***Ode of Casimir Translated.*

Sweet harp, of well-framed box the vocal child !
 Here shalt thou hang on this tall poplar's spray,
 While ether smiles, and breezes mild
 Amid its pendant foliage play.
 Eurus shall here, but borne on softest wing,
 Whisper and pant thy warbling chords among,
 While pleaséd my careless limbs I fling
 On this green bank, and mark thy song—
 But lo ! what sudden clouds veil the blue skies !
 What rushing sound of rain ! Rise we with speed—
 Ah ! always thus, ye light-winged joys,
 Ye fly, and ere possessed are fled !

***6. 1199.—KING JOHN BEGAN TO REIGN.**

The character of this prince is nothing but a complication of vices, equally mean and odious, ruinous to himself, and destructive to his people: cowardice, inactivity, folly, levity, licentiousness, ingratitude, treachery, tyranny, and cruelty; all these qualities too evidently appear in the several incidents of his life, to give us room to suspect that the disagreeable picture has been anywise overcharged by the prejudice of the antient historians. It is hard to say, whether his conduct to his father, his brother, his nephew, or

his subjects, was most culpable; or whether his crimes in these respects were not even exceeded by the baseness which appeared in his transactions with the King of France, the pope, and the barons. His dominions, when they devolved to him by the death of his brother, were more extensive than have ever since his time been ruled by any English monarch. But he first lost, by his misconduct, the flourishing provinces in France; the antient patrimony of his family. He subjected his kingdom to a shameful vassalage under the see of Rome; he saw the prerogatives of his crown diminished by law, and still more reduced by faction; and he died at last when in danger of being totally expelled by a foreign power, and of either ending his life miserably in a prison, or seeking shelter as a fugitive from the pursuit of his enemies.—*Hume*.

Englishman!

Curse not his memory, Murderer as he was,
 Coward and slave, yet he it was who signed
 That charter, which should make thee morn and night
 Be thankful for thy birth-place:—Englishman!
 That holy charter, which, shouldst thou permit
 Force to destroy, or Fraud to undermine,
 Thy children's groans will persecute thy soul,
 For they must bear the burthen of thy crime.

SOUTHEY:

6.—EASTER-DAY, OR EASTER SUNDAY.

Easter is styled, by the fathers, the highest of all festivals, the feast of feasts, the queen of festivals, and *Dominica Gaudii*, the joyous Sunday. Masters granted freedom to their slaves at this season, and valuable presents were made to the poor.

For the august ceremonies performed at Rome on this day, Whitsuntide, and other great festivals, we refer to T. T. for 1815, p. 165. The magnificent ceremony of the *Resurrection*, at Moscow, is also described at p. 90 of the same volume. A variety of old English customs observed at Easter have been mentioned in our former volumes.

7, 8.—EASTER MONDAY AND TUESDAY.

Every day in this week was formerly observed as a religious festival, sermons being preached, and the sacrament administered. In many places, servants were permitted to rest from their usual employments, that they might constantly attend public worship. During fifteen days, of which the paschal solemnity consisted, the courts of justice were shut, and all public games, shows, and amusements, were prohibited: it is unnecessary to observe, that this practice has long ceased, and that the Easter week is usually devoted to relaxation and amusement; this is particularly the case at Moscow, and in Catholic countries.—See T. T. for 1815, p. 93.

We have, in our former volumes, already noticed the strange custom of *Heaving* practised on this day in the north of England. The following extract, from a letter sent to Mr. BRAND, the antiquarian, by a respectable gentleman, in the year 1799, thus speaks of the custom. ‘I was sitting alone last Easter Tuesday, at breakfast, at the Talbot, in Shrewsbury, when I was surprised by the entrance of all the female servants of the house, handing in an arm-chair, lined with white, and decorated with ribbons and favours of different colours. On asking what they wanted, their answer was, “they came to *heave* me: it was the custom of the place on that morning, and they hoped I would take a seat in their chair.” It was impossible not to comply with a request very modestly made, and to a set of nymphs in their best apparel, and several of them under twenty. I wished to see all the ceremony, and seated myself accordingly. The fair group then lifted me from the ground, turned the chair about, and I had the felicity of a salute from each. I told them, I supposed there was a fine due upon the occasion, and was answered in the affirmative, and, having satisfied the damsels, they withdrew to *heave* others. At this time I had never heard of such a custom; but, on inquiry, I

found that on Easter Monday, between nine and twelve, the men heave the women in the same manner as on the Tuesday, between the same hours, the women heave the men.'—See *Popular Antiquities*, 4to. edit.

*9. 1483.—EDWARD V BEGAN TO REIGN.

*12. 1736.—FIRST METHODIST CHAPEL ERECTED.

13.—LOW SUNDAY.

It was a custom among the primitive Christians, on the first Sunday after Easter-day, to repeat some part of the solemnity of that grand festival; whence this Sunday took the name of *Low Sunday*, being celebrated as a feast, though in a lower degree.

*16.- 1788.—BUFFON DIED.

At Montbard, in France, in the route from Paris to Dijon, the house in which Buffon spent the greatest part of his life may yet be inspected by the curious traveller. It is in the high street, and the court is behind. You ascend a staircase to go into the garden, raised on the ruins of the antient mansion, of which the walls make the terraces. On the top there still remains a lofty octagon tower, where Buffon made his observations on the reverberation of the air. This singular and picturesque garden is well worthy of notice. In quitting this interesting spot, the column erected to Buffon by his son is seen, on which there was once the following inscription: '*Excelsæ turri humiles columna—Parenti suo filius Buffon.*' That revolution which caused these words to be effaced, also condemned to the scaffold the writer of them, who died, pronouncing only, in a calm and dignified tone, '*Citizens, my name is—BUFFON!*'

19.—SAINT ALPHEGE.

A native of England, Alphege was first Abbot of Bath, then Bishop of Winchester, in the year 984; and, twelve years afterwards, Archbishop of Canterbury. He was stoned to death at Greenwich.

*21. 1219.—SAINT DOMINIC

Found at Paris thirty of his religious followers in the chapel of St. James, and, in consequence of the name of the chapel and the street where it stood, he called them *Jacobins*. This was the origin of an Order which exercised great power over kings. St. Louis had so much love for this community, that he wished to be made a Jacobin. He proposed his design to the queen, and conjured her not to oppose it. That princess immediately sent for her children and the Earl of Anjou, brother of the King; she demanded of the first whether they would prefer being the sons of a priest rather than the sons of a king? And, without waiting for their answer, she exclaimed, 'The Jacobins have worked on the mind of your father, and persuaded him to abdicate the throne in order to become a priest and a preacher.' At these words, the Earl of Anjou expressed his determination to oppose the king and the priests; and the eldest son of the monarch swore by St. Denis, that, if ever he came to the throne, he would drive every mendicant idle priest out of his kingdom. The fanatic passion of St. Louis for crusades brought him to his death, near the ruins of Carthage, fighting against *Mussulmen* in a country where Dido had established the gods of the Syrians. This king extended that religious enthusiasm which depopulated Europe during two centuries.

*22. 1509.—HENRY VIII BEGAN TO REIGN.

The absolute and uncontrolled authority which he maintained at home, and the regard he obtained among foreign nations, are circumstances which entitle him to the appellation of a great prince; while his tyranny and cruelty seem to exclude him from the character of a good one.

He possessed, indeed, great vigour of mind, which qualified him for exercising dominion over men—courage, intrepidity, vigilance, inflexibility; and though these qualities lay not always under the guidance of a

regular and solid judgment, they were accompanied with good parts, and an extensive capacity ; and every one dreaded a contest with a man who was never known to yield, or to forgive ; and who, in every controversy, was determined to ruin himself, or his antagonist.

A catalogue of his vices would comprehend many of the worst qualities incident to human nature. Violence, cruelty, profusion, rapacity, injustice, obstinacy, arrogance, bigotry, presumption, caprice ; but neither was he subject to all these vices in the most extreme degree, nor was he at intervals altogether devoid of virtues. He was sincere, open, gallant, liberal, and capable at least of a temporary friendship and attachment.

It may seem a little extraordinary, that notwithstanding his cruelty, his extortion, his violence, his arbitrary administration, this prince not only acquired the regard of his subjects, but never was the object of their hatred ; he seems even, in some degree, to have possessed their love and affection. His exterior qualities were advantageous, and fit to captivate the multitude ; his magnificence and personal bravery rendered him illustrious to vulgar eyes ; and it may be said with truth, that the English in that age were so thoroughly subdued, that, like eastern slaves, they were inclined to admire even those acts of violence and tyranny which were exercised over themselves, and at their own expense.—*Hume*.

*22. 1663.—ROYAL SOCIETY INCORPORATED.

23.—SAINT GEORGE.

This illustrious saint, termed, by the Greeks, the 'great martyr,' was born in Cappadocia, of noble Christian parents, and was a tribune or colonel in the army under Dioclesian. He was beheaded in the year 290. Under the name and ensign of St. George, Edward III, in 1330, instituted the most noble order of knighthood in Europe.—See T. T. for 1815, p. 124.

***23. 1564.—SHAKSPEARE BORN.**

What needs my SHAKSPEARE for his honoured bones,
 The labour of an age in piled stones;
 Or that his hallowed relics should be hid
 Under a star-y-pointing pyramid?
 Dear son of memory, great heir of fame,
 What need'st thou such weak witness of thy name?
 Thou, in our wonder and astonishment,
 Has built thyself a live-long monument;
 For whilst, to the shame of slow-endeavouring art,
 Thy easy numbers flow; and that each heart
 Hath, from the leaves of thy unvalued book,
 Those Delphic lines with deep impression took,
 Then thou, our fancy of itself bereaving,
 Dost make us marble with too much conceiving;
 And, so sepulchered, in such pomp dost lie,
 That kings, for such a tomb, would wish to die.

MILTON.

***23. 1616.—CERVANTES DIED.**

Great sage, whose wand at one commanding stroke
 Each antique pile of elfin fabric broke;
 From midnight spectres purged the sorcerer's cell,
 And burst stern chivalry's fantastic spell.

More than *twelve thousand* copies of the first part of Don Quixote were circulated before the second could be got ready for the press; an amazing rapidity of sale, at a time when the readers and purchasers of books were but an inconsiderable number, compared with what they are now. The very children, says Cervantes, handle it, boys read it, men understand, and old people applaud the performance. It is no sooner laid down by one, than another takes it up; some struggling, and some entreating for a sight of it. In fine, continues he, this history is the most delightful, and the least prejudicial entertainment, that ever was seen; for, in the whole book, there is not the least shadow of a dishonourable word, nor one thought unworthy of a good catholic.

***23. 1616.—SHAKSPEARE DIED.**

From you have I been absent in the spring,
 When proud-pied April, dressed in all his trim,

Hath put a spirit of youth in every thing ;
 That heavy Saturn laughed and leaped with him.
 Yet nor the lays of birds, nor the sweet smell
 Of different flowers in odour and in hue,
 Could make me any summer's story tell,
 Or from their proud lap pluck them where they grew :
 Nor did I wonder at the lilies white,
 Nor praise the deep vermillion in the rose ;
 They were but sweet, but figures of delight,
 Drawn after you, you pattern of all those.
 Yet seemed it winter still, and, you away,
 As with your shadow I with these did play :

The forward violet thus did I chide ;—
 Sweet thief, whence didst thou steal thy sweet that smells,
 If not from my love's breath ? The purple pride
 Which on thy soft cheek for complexion dwells,
 In my love's veins thou hast too grossly dyed.
 The lily I condemned for thy hand,
 And buds of marjoram had stolen thy hair ;
 The roses fearfully on thorns did stand,
 One blushing shame, another white despair ;
 A third, nor red nor white, had stolen of both,
 And to his robbery had annexed thy breath ;
 But for his theft, in pride of all his growth
 A vengeful canker eat him up to death.
 More flowers I noted, yet I none could see,
 But sweet or colour it had stolen from thee.

25.—SAINT MARK.

St. Mark's Gospel was written in the year 63. The Order of Knights of St. Mark at Venice, under the protection of this evangelist, was instituted in the year 737, the reigning doge being always grand master :—their motto was, '*Pax tibi, Marce, Evangelista Meus.*'

*25. 1595.—TASSO DIED.

*27. 1794.—SIR WILLIAM JONES DIED.

Astronomical Occurrences

In APRIL 1817.

THE Sun enters Taurus on the 20th of this month, at 28 m. past 11 in the morning ; and the following

Table shows the time of his rising and setting for every fifth day of the same period, viz.

TABLE.

Tuesday,	April 1,	Sun rises 33 m. after 5.	Sets 37 m. after 6
Sunday,	— 6,	. . . 23 . . . 5 . . . 37 . . . 6	
Friday,	— 11,	. . . 14 . . . 5 . . . 46 . . . 6	
Wednesday,	— 16,	. . . 4 . . . 5 . . . 56 . . . 6	
Monday,	— 21,	. . . 55 . . . 4 . . . 5 . . . 7	
Saturday,	— 26,	. . . 46 . . . 4 . . . 14 . . . 7	

The quantity to be added to or subtracted from the time, as shown by a correct sun-dial, to obtain the time which should be indicated by a well regulated clock, for every fifth day of the month, is given in the following

TABLE.

April 1st, to the time by the dial	add	m.	s.
6th,		4	1
11th,		2	31
16th, from the time by the dial	subtract	0	11
21st,		1	20
26th,		2	17

The Moon will be full at 9 m. past 11 on the evening of the 1st of this month; she will enter her last quarter at 28 m. after 3 in the afternoon of the 8th; there will be a new Moon at 28 m. past 2 in the afternoon of the 16th; and the first quarter will commence at 23 m. past 3 in the afternoon of the 24th.

The Moon will pass the meridian on the following days of this month, at a convenient time to be seen, viz.

7th day, at 53 m. after	4	in the morning.
8th . . . 52 . . .	5	. . . . .
26th . . . 16 . . .	8	in the evening.
27th . . . 7 . . .	9	. . . . .
28th . . . 59 . . .	9	. . . . .
29th . . . 51 . . .	10	. . . . .
30th . . . 45 . . .	11	. . . . .

On the evening of the 3d of the present month, the Moon will eclipse the star marked α in the sign Libra. The immersion will take place 28 m. after 11,

and the emersion 53 m. after the same hour. In the former case, the star will be $16\frac{1}{4}$ south of the Moon's centre; and in the latter, $13\frac{1}{4}$ south of the same.

On the 18th of this month, Mars and Saturn will be nearly in contact; and on the 19th, at 2 in the afternoon, Mercury will be in his superior conjunction.

The eclipses of Jupiter's first and second satellites, which will be visible in the vicinity of the Royal Observatory this month, are the following, viz.

IMMERSIONS.

1st Satellite, 9th day, 28 m. past 2 in the morning.

. 25th . . . 44 . . . 0

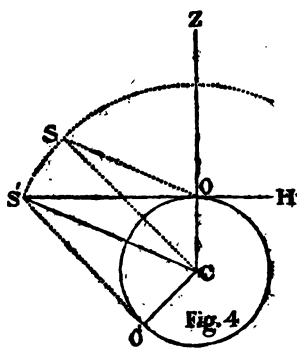
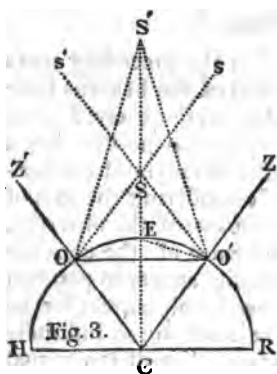
2d Satellite, 24th . . . 35 . . . 2

On Parallax.

IN what has been advanced in the preceding parts of these volumes, the phenomena of the heavens have been considered as though they were observed from the centre of the earth, or as if the earth were only a physical point with respect to the distances of the heavenly bodies. This method of considering the axis of revolution as passing through the eye of the observer, and that eye as situated at the centre of the concave sphere, in which the heavenly bodies appear to perform their diurnal revolutions, however, is only correct for the stars, whose distances from the earth are so infinitely great with respect to its radius, that all the visual rays from different parts of the earth's surface to the same star may be regarded as parallel to each other, without any sensible error. But this principle cannot be applied to the bodies which constitute the solar system, without introducing considerable error into the results of our inquiries relative to their real positions in the heavens, and other phenomena. The following explanations on this subject are therefore intended to point out these errors, and enable the young astronomer to correct them; and, by these means, to obtain a clearer comprehension of our fu-

ture observations, and a more accurate knowledge of the subjects that may become the matter of our subsequent dissertations.

When a heavenly body is observed from different points of the earth's surface at the same time, it does *not* appear to be situated in the same point of the heavens. For, let S be the body (fig. 3), C the centre of the earth, O and O' the positions of two observers situated on the same meridian HR ; and OS and $O'S$ the visual rays from their eyes to the body S , at the moment it comes into the plane in which they are situated. Then as objects are always seen in the direction of the visual rays that proceeded from them to the eye of the observer, to a person placed at O on the



surface of the earth, the body S would appear to be situated in the celestial sphere at s , and to the observer at O' its apparent place in the heavens would be at s' . The difference of these two results depends upon the angle OSO' , under which an observer, placed at the centre of the body S , would see the chord OO' of the terrestrial arc which separates the two observers; and it is this angle which is called the *parallax*, and sometimes the *parallactic angle*.

The influence of parallax will be readily understood,

independently of any astronomical calculations, by attending to the following observations. In the preceding figure, suppose the Moon to be at S and the Sun at S', at a much greater distance from the earth (and which is actually the case), then each of the observers, situated at O and O', would see both bodies at the same time, and perceive the distance which separates them; but at the point E, in the line CS', which passes through their centres, this distance would not appear, and the Sun would be eclipsed. Thus, when a cloud passes between us and the Sun, we find ourselves enveloped in its shadow, while places at a little distance experience the full influence of the solar beams: the difference of these effects is owing to the parallax.

In order to avoid the irregularities depending upon the different aspects under which the same body is seen from different points on the globe, or the difference of its apparent situations in the heavens, and render the observations susceptible of being compared with each other, astronomers suppose the earth to be either a sphere or a spheroid, and refer all their observations to its centre; regarding that as the *true place* of a heavenly body in which it would appear if seen from this point. The place in the celestial sphere, in which a body appears to be situated when seen from any point of the earth's surface not in the right line which joins the centre of the earth and that of the body, they denominate the *apparent place* of that body, in opposition to the true place. Now, in this case, one of the observers may be considered as situated at E, and then the subtending chord becomes OE, and the parallactic angle OSE; and which being the same as OSC, the *parallax* is said to be the angle which the *radius* of the earth, drawn to the point of observation O, subtends at the centre of the heavenly body. We shall endeavour to illustrate this on the supposition that the earth is spherical, and the distance between it and the heavenly body con-

start; and which, even in calculation, is sufficiently accurate for most common purposes.

If the zenith distance of the Sun, Moon, or a star situated at S , be observed at the point O , it will be equal to the angle ZOS , Z being the zenith; but if it had been observed from the centre of the earth, it would have been equal to the angle ZCS , or to $ZOS - OSC$; because the angle ZOS is the exterior angle of the triangle COS . This angle CSO , found by the two visual rays drawn from the body S to O and C , is called the *parallax of altitude*. Hence, if this *parallax be subtracted from the apparent or observed zenith distance, it will give the true distance of that body from the zenith of the observer*.

From this it may also be observed that the two visual rays SO and SC , being both situated in the same vertical plane, the effect of parallax, like that of refraction, is wholly in a vertical direction; or, in general terms, always in the plane passing through the body, the centre of motion, and the eye of the observer. The parallax must be subtracted from the zenith distance, or added to the altitude; but, on the contrary, refraction is to be subtracted from the altitude and added to the zenith distance, since their effects take place in opposite directions.—See our observations on refraction, after the *Astronomical Occurrences* of last month.

This depression occasioned by the parallax depends upon the magnitude of the angle CSO ; it is not the same for all altitudes. The distance of the body from the earth being supposed constant, this angle will be the greatest at the horizon; as $OS'C$ (fig. 4, p. 102), which is denominated the *horizontal parallax*. If, from the point S' , two tangents to the circle which represents the circumference of the earth be drawn to O and O' , the horizontal parallax will be half the visual angle $OS'O'$, under which the earth would appear to an observer placed at the body; or which is, in effect, the same with respect to an observer so

situated, it is equal to the angle subtended by half the apparent diameter of the earth. The horizontal parallax is therefore the greatest; and the parallax of altitude, or the angle OSC, diminishes as the body is more elevated above the horizon, until it becomes nothing at the zenith, because the visual ray from the observer and that from the centre of the earth then coincide, as OZ and CZ in figure 4, or ES' and CS', fig. 3. The law of this diminution is easily calculated by the common rules of plane trigonometry, supposing the distance of the body from the earth's centre not to vary during a diurnal revolution. On these principles, we find that the parallax answering to any apparent altitude, is equal to the horizontal parallax multiplied by the sine of the apparent zenith distance¹.

[To be concluded next Month.]

¹ The apparent zenith distance (the angle SOZ=SOC) being known and denoted by z , in the triangle OSC (fig. 4), in which the sines of the angles are proportional to their opposite sides, we have $SC : OC :: \sin. SOC : \sin. OSC$. Then denoting the distance of the body S from the centre of the earth by D , the radius CO by r , and the parallax by P , we shall have from the

preceding proportion $\sin. P = \frac{r \sin. z}{D}$. But when the body is in

the horizon or the zenith distance equal 90° , the sine of z becomes $= 1$; and the horizontal parallax being represented by h ,

we have $\sin. h = \frac{r}{D}$. Then, exterminating D , by means of its

value in each of these equations, and we obtain $\sin. P = \sin. h \cdot \sin. z$. Now, since the distances of the heavenly bodies are so great, compared with the radius of the earth, the parallax angles will always be very small; even for the Moon, which is much the nearest to the earth, it is only about 1° at the horizon; and therefore the arcs may be substituted for their sines, with-

out committing an error in the result, equal to $\frac{1}{6536}$ th part of the whole arc. Hence $P = h \sin. z$; the result above stated.

From the above formula, $\sin. h = \frac{r}{D}$, it is evident that the horizontal parallax is the greatest possible; and that it is insen-

The Naturalist's Diary.

Now the golden morn aloft
 Waves her dew-bespangled wing,
 With vermeil cheek, and whisper soft,
 She woos the tardy spring;
 Till APRIL starts, and calls around
 The sleeping fragrance from the ground;
 And lightly o'er the living scene
 Scatters his freshest, tenderest green.

GRAY,

If there has been a medium proportion of easterly winds in the previous part of the winter, the month of April may be expected to be mild, with gentle showers; thus affording to vegetables an abundant supply of water, which is so indispensably necessary to their existence. The many thousand tribes of *vegetables* are not only formed from a few simple substances, but enjoy the same sun, vegetate in the same medium, and are supplied with the same nutriment. It is, indeed, wonderful that all orders of vegetables are produced from four or five natural substances, viz. caloric, light, water, air, and carbon. How admirable, then, must the formation of those organs be, which, by their peculiar actions, shall produce such various modifications of these sub-

sible when the ratio $\frac{r}{D}$ is very small, and nothing when the distance D of the body from the centre of motion is incomparably great with respect to r , the distance of the observer from the same point. This takes place with respect to the stars, the parallax of which cannot be ascertained by observation. In order, however, that the parallax may be absolutely nothing, it is necessary that $D = \text{infinity}$, or $r = 0$, which is not possible; but if $\frac{r}{D} = \sin. 1''$
 $= \frac{1}{206264.8}$, the parallax would at most be $1''$, which it is impossible to ascertain by observation.

stances, so as to form the different colours, tints, odours, tastes, &c. of the vegetable kingdom! How surprising must be the progress of vegetation! How rich the economy of nature!

It is now allowed, that there is both a vital circulation of the juices in vegetables, and a large perspiration from their pores; which latter is become a subject of great curiosity and importance, from the successful labours of those who have cultivated this part of natural philosophy. The circulation in plants is strong in the spring, and languid in the winter; in some it is so forcible and abundant, that, if their vessels are opened at an improper season, they will bleed to death, as when an artery is divided in the human body. If the finer spirit evaporates from a plant, and it has no fresh supply, it becomes instantly flaccid and fading, as an animal body dies with the departure of its breath.

The process of vegetation is forwarded in a wonderful manner by the vicissitude of day and night, and the changes of the weather. The heat of the sun raises a moist, elastic vapour, which fills and expands certain vessels in plants, and so gradually enlarges their bulk; while the colder air of the night condenses and digests the matter which has been raised, and so confirms the work of the day. We complain of cold blasts and clouded skies, by the intervention of which vegetation rapidly advancing is suddenly stopped and seems stationary: but this may be wisely ordained by Providence; the growth of herbs may be too hasty; they are weak in substance, if they are drawn forward too fast. A cold season prevents this too hasty growth; as in the moral world some seasonable disappointment may give a salutary check to an aspiring mind, and establish it in wisdom and patience. Even the roughest motions of the elements have their use. Winds and storms, which agitate the body of trees and herbs, loosen the earth about their roots, and make way for their fibres to multiply,

and to strike more kindly into the soil, to find new nourishment. Thus is nature more effectually progressive when it seems to be stationary or even retrograde; and all things work together for good; which they could never do but under the foresight and direction of an all-wise Providence.

But above all, the showers of heaven, concurring with the sun, promote the work of vegetation. They keep the matter of the soil soluble, and consequently moveable; for salts cannot act but in a state of solution; they furnish matter for an expansive vapour, which acts internally and externally; and, what is but little understood, though equally worthy of admiration, the rain brings down with it an invigorating ethereal spirit from the clouds, which gives it an efficacy far beyond all the waterings which human labour can administer¹.

A thousand hues flush o'er the fragrant earth,
 Or tinge the infant germs of every tree
 That bursts with teeming life. Her various vest
 The gentle Spring assumes, refulgent less
 Than Autumn's robe, but, O! how soft, how gay,
 The pleasing tints that steal upon the eye!
 How white the fields with countless daisies drest!
 Fair too the leafless hedge with the prime sweets
 Of early thorn; the while the Hawthorn bursts
 With tender green. How blue the devious dell,
 The rivulet's winding banks, the tangled copse,
 With harebell flowers.

BIDLAKE.

The arrival of the swallow about the middle of this month announces the approach of summer, and now all Nature assumes a more cheerful aspect. The swallow tribe is of all others the most inoffensive, harmless, entertaining, and social: all, except one species, attach themselves to our houses, amuse us with their migrations, songs, and marvellous agility,

¹ For further information on botanical subjects we refer the student to the 'Elements of Botany' prefixed to our last volume; and to Mr. W. Curtis's excellent *Lectures on Botany*.

and clear the air of gnats and other troublesome insects, which would, otherwise, much annoy and incommode us.

The gorse is yellow on the heath,
 The banks with speedwell flowers are gay,
 The oaks are budding, and beneath
 The hawthorn soon will bear the wreath,
 The silver wreath of May.

The welcome guest of settled spring,
 The *Swallow*, too, is come at last;
 Just at sun-set, when thrushes sing,
 I saw her dash with rapid wing,
 And hailed her as she passed.

Come, summer visitant, attach
 To my reed roof your nest of clay,
 And let my ear your music catch
 Low twittering underneath the thatch,
 At the green dawn of day.

CHARLOTTE SMITH.

There are four species of the hirundines that visit England; they arrive in the following order:—

(1.) The chimney swallow (*hirundo rustica*) builds its nest generally in chimnies, in the inside, within a few feet of the top, or under the eaves of houses.

(2.) The house martin (*hirundo urbica*), known by its white breast and black back, glossed with blue, visits us in great numbers. It builds under the eaves of houses, or close by the sides of the windows.

(3.) The sand martin (*hirundo riparia*) is the smallest of our swallows, as well as the least numerous of them. It frequents the steep, sandy banks, in the neighbourhood of rivers, in the sides of which it makes deep holes, and places the nest at the end.

(4.) The swift (*hirundo apus*) is the largest species, measuring nearly eight inches in length. These birds build their nests in lofty steeples and high towers, and sometimes under the arches of bridges.

The return of the swallow, as well as of the numerous singing birds, which fill our woods, and 'pour their little throats' in praise of their great Creator, demands from us a grateful welcome; and

this we cheerfully give them, in the animated lines of the Abbé DE LILLE :—

Revenez, peuple heureux, revoir votre patrie,
 Revenez habiter votre rive chérie :
 Quel bien manque à vos vœux, intéressants oiseaux ?
 Vous possédez les airs, et la terre, et les eaux ;
 Sous la feuille tremblante un zéphyr vous éveille,
 Vos couleurs charment l'œil, et vos accents l'oreille ;
 Vos désirs modérés ignorent à la fois
 Et les vices du luxe, et la rigueur des lois ;
 Un coup d'aile corrige une amante coquette,
 Un coup de bec suffit à sa simple toilette.
 Si vous prenez l'essor vers des bords reculés,
 Vous êtes voyageurs et non pas exilés ;
 Le bocage qui vit votre famille éclore
 Sur le même rameau vous voit bâtir encore ;
 Même ombrage revoit vos amoureux penchans,
 Et les mêmes échos répondent à vos chants'.

The next bird which appears is that sweet warbler, the *motacilla lusciniæ*, or nightingale. Although the nightingale is common in this country, it never visits the northern parts of our island, and is but seldom seen in the western counties of Devonshire and Cornwall, or in Wales ; though it annually visits Sweden. It leaves us sometime in the month of August, and makes its regular return in the beginning of April.

In England, nightingales frequent thick hedges and low coppices, and generally conceal themselves in the middle of some leafy bush. They commence their song in the evening, and continue it the whole night. Perhaps part of its fame, and certainly much of its effect, are owing to this circumstance. During the solemn stilness of the night, when other animals are at rest, every sound is heard to advantage, and produces a deeper impression.

If aught can soothe the ruffling gales of grief,
 More stormy blown by cruel memory's power,
 And bless the woe-pierced bosom with relief,
 I seek it in the twilight's placid hour.

For then, sweet bird, thy lonely groves among,
A pleasing melancholy o'er me steals;
And fancy thinks, as listening to thy song,
Thy breast some barbed shaft of sorrow feels,
That thus thou shunn'st the lustre of the day,
To pour thy pensive notes so sweetly here,
Remote from cold neglect's averted ear;
And as thy warblings softly die away,
Awhile I cease to mourn on moments flown,
And in thy sorrows seem to lose my own.

ORAM.

So various, sweet, and continuous, are the notes of this bird, that the songs of other warblers, taken in their utmost extent, are insignificant compared to his. His variety appears inexhaustible; he never repeats the same note twice, without some change of key or embellishment. As often, indeed, as this leader of the feathered choir prepares to conduct the hymn of Nature, he begins by feeble, timid, and indecisive tones, as if to try his instrument. By degrees he assumes more confidence, becomes gradually more warm and animated, till, at last, he captivates and overwhelms his audience with the full exertion of his astonishing powers. Pliny has given an admirable description of these qualities of the nightingale, in recording the spirit of emulation which it displays in its song. Two of them, he observes, will continue to carry on an obstinate contest for victory, till the vanquished bird drops lifeless on the ground¹.

To the NIGHTINGALE.

Sweet bird, that sing'st away the early hours,
Of winters past or coming, void of care,
Well pleased with delights which present are;
Fair seasons, budding sprays, sweet-smelling flowers!
To rocks, to springs, to rills, from leafy bowers

¹ For many interesting particulars of the nightingale, see our last volume, pp. 117—120; T. T. for 1815, p. 139; and T. T. for 1814, p. 99.

Thou thy Creator's goodness dost declare,
 And what dear gifts on thee he did not spare;
 A stain to human sense in sin that lowers.
 What soul can be so sick, which by thy songs
 Attired in sweetness sweetly is not driven
 Quite to forget earth's turmoils, spites, and wrongs,
 And lift a reverend eye and thought to heaven?
 Sweet artless songster, thou my mind dost raise
 To airs of spheres, yes, and to angels' lays!

DRUMMOND,

Yet the notes of the *Mocking-thrush* of America are said to be of a livelier nature, a bolder strain, and of a more varied richness and force of tone, than the nightingale's. It sings both by day and night; and generally seats itself at the top of some small tree, where it exerts a voice so powerfully strong, and so sweetly melodious, as to charm, even to rapture, those who listen to its lays. If we may rely on the attestations of those who have resided on the western continent, all the thrilling sweetness and varied modulation of the nightingale must yield to the transcendent music of the songstress of America¹.

That beautiful little bird, the wryneck (*jynx torquilla*) makes its appearance about the middle of the month, preceding the *cuckoo* by a few days. The well-known cry of the *cuculus canorus* is heard soon after the wryneck, and ceases the latter end of June;

¹ It is about the size of a *thrush*. Its natural notes are musical and solemn; but it likewise possesses the singular power of assuming the tones of every other animal, whether quadruped or bird. It seems to divert itself with alternately alluring or terrifying other birds, and to sport with their hopes and their fears. Sometimes it entices them with the call of their mates, and, on their approach, terrifies them with the scream of the eagle, or some other bird of prey. It frequents the habitations of mankind, and is easily domesticated; it builds its nest in the fruit trees, near the houses of the planters; and, sitting sometimes most of the night on the tops of their chimnies, assumes its own native melody, and pours forth the sweetest and most varied strains. The savages call it *Cencontlatolli*, or Four Hundred Languages. It is found in Carolina, New Spain, &c. and is very common in the savannahs of Jamaica.

its stay is short, the old cuckoos being said to quit this country the latter end of June. ' Some interesting particulars respecting the cuckoo we select from a communication to the New Universal Magazine for August 1815 (vol. iii, p. 87).

' The first appearance of cuckoos in Gloucestershire (the part of England where these observations were made) is about the 17th of April. The song of the male, which is well known, soon proclaims its arrival. The song of the female (if the peculiar notes of which it is composed may be so called) is widely different; the cry of the dab-chick bears the nearest resemblance to it.

' From the time of the appearance of the female, till after the middle of summer, the nests of the birds selected to receive her eggs are to be found in great abundance; but, like the other migrating birds, she does not begin to lay till some weeks after her arrival. I never could procure an egg till after the middle of May, though, probably, an early-coming cuckoo may produce one/sooner.

' The cuckoo makes choice of the nests of a variety of small birds. I have known its egg entrusted to the care of the hedge-sparrow, the water-wagtail, the titlark, the yellow-hammer, the green-linnet, and the winchat. Among these it generally selects the three former; but shows a much greater partiality to the hedge-sparrow than to any of the rest.

' The hedge-sparrow commonly takes up four or five days in laying her eggs. During this time (generally after she has laid one or two), the cuckoo contrives to deposit her egg among the rest, leaving the future care of it entirely to the hedge-sparrow. This intrusion often occasions some discomposure; for the old hedge-sparrow at intervals, while she is sitting, not unfrequently throws out some of her own eggs, and sometimes injures them in such a way that they become addle; so that it more frequently happens, that only two or three hedge-

sparrow's eggs are hatched with the cuckoo's than otherwise: but whether this be the case or not, she sits the same length of time as if no foreign egg had been introduced, the cuckoo's egg requiring no longer incubation than her own. However, I have never seen an instance where the hedge-sparrow has either thrown out or injured the egg of the cuckoo.

'When the hedge-sparrow has sat her usual time, and disengaged the young cuckoo and some of her own offspring from the shell, her own young ones, and any of her eggs that remain unhatched, are soon turned out, the young cuckoo remaining possessor of the nest, and sole object of her future care. The young birds are not previously killed, nor are the eggs demolished, but all are left to perish together, either entangled about the bush which contains the nest, or lying on the ground under it.'

The other summer-birds of passage which arrive this month, make their appearance in the following order: the ring-ousel (*turdus torquatus*), the red-start (*motacilla phoenicurus*), frequenting old walls and ruinous edifices; the yellow wren (*motacilla trochilus*); the swift, already noticed; the whitethroat (*motacilla sylvia*); the grasshopper lark (*alauda trivialis*), the smallest of the lark kind; and, lastly, the willow-wren, which frequents hedges and shrubberies, and feeds on insects, in search of which it is continually running up and down small branches of trees. The house-wren destroys many pernicious insects. *Plovers' eggs* now come into season, and are exhibited in small baskets, laid in moss, in the shops of fishmongers and poulterers. A plover lays four eggs of a dark olive colour, spotted, in irregular spots, of very dark brown or black. The eggs of rooks and jackdaws have been sometimes substituted for them; but the white of the plover's eggs, when boiled, is nearly transparent; that of the rook and jackdaw is opaque.

The tenants of the air, are, in this month, busily

employed in forming their temporary habitations, and in rearing and maintaining their offspring.

L'un au chêne orgueilleux, l'autre à l'humble arbrisseau,
De ses jeunes enfants confia le berceau ;
Là, des œufs maternels nouvellement éclosés,
Sur le plus doux coton la famille repose,
Et la laine et le crin, assemblés avec art,
De leur tissu serré leur forment un rempart
Dont le tour régulier, l'exacte symétrie,
Désirait le compas de la géométrie.

DE LILLE.

About the middle of this month, the bittern (*ardea stellaris*) makes a hollow booming noise during the night in the breeding season, from its swampy retreats. Towards the end of the month, the black-cap (*motacilla atricapilla*), called, in Norfolk, the mock-nightingale, begins its song.

The progress of vegetation is general and rapid, in this month. The blossoms of trees present to the eye a most agreeable spectacle, particularly in those counties which abound with orchards. The black-thorn (*prunus spinosa*) is the first that puts forth its flowers ; a host of others follow, among which may be named the ash (*fraxinus excelsior*), ground-ivy (*glecoma hederacea*), the box-tree (*buxus sempervirens*), the pear-tree (*pyrus communis*), the apricot, the peach, nectarine, the wild and garden cherry, and the plum ; gooseberry and currant-trees ; the hawthorn (*crataegus oxyantha*), the apple-tree (*pyrus malus sativus*), and the sycamore (*acer pseudo-platanus*). The elm (*ulmus campestris*), the beech (*fagus sylvatica*), and the larch (*pinus-larix rubra*), are now in full leaf.

Loosed from the bands of frost, the verdant ground
Again puts on her robe of cheerful green,
Again puts forth her flow'rs ; and all around,
Smiling, the cheerful face of spring is seen.

Behold ! the trees new-deck their withered boughs ;
Their ample leaves the hospitable plane,
The taper elm, and lofty ash disclose:
The blooming hawthorn variegates the scene.

The *lily* of the vale, of flow'rs the queen,
 Puts on the robe she neither sewed nor spun :
 The birds on ground, or on the branches green,
 Hop to and fro, and glitter in the sun.

Soon as o'er eastern hills the morning peers,
 From her low nest the tufted *lark* upsprings ;
 And, cheerful singing, up the air she steers ;
 Still high she mounts, still loud and sweet she sings.

On the green furze, clothed o'er with golden blooms,
 That fill the air with fragrance all around,
 The *linnet* sits, and tricks his glossy plumes,
 While o'er the wild his broken notes resound.

BRUCE.

Many and lovely are the flowers which are showered, in profusion, from the lap of April : among them may be named, the jonquil, anemoné, ranunculus, polyanthus, and the crown-imperial.

Other flowers which adorn our fields, at this time, are the chequered daffodil (*fritillaria meleagris*) ; the primrose ; the cowslip (*primula veris*) ; the cuckoo flower (*cardamine pratensis*) ; and the harebell (*hyacinthus non scriptus*). The yellow star of Bethlehem (*ornithogalum luteum*) in woods ; the vernal squill (*scilla verna*) among maritime rocks ; and the wood sorrel (*oxalis acetosella*), are now in full flower¹.

Various kinds of insects are now seen 'sporting in the sun-beams,' and living their 'little hour.' The jumping spider (*aranea scenica*) is seen on garden

¹ But too often we are led to exclaim, in this month, with the poet, in his beautiful sonnet to the Sun :—

No longer let these mists thy radiance shroud,
 These cold raw mists that chill the comfortless day ;
 But shed thy splendour thro' the opening cloud,
 And cheer the earth once more. The languid flowers
 Lie odourless, beat down with heavy rain,
 Earth asks thy presence, saturate with showers ;
 O Lord of Light ! put forth thy beams again,
 For damp and cheerless are the gloomy hours.

SOUTHEY.

walls; and the webs of other species of spiders are found on the bushes, palings, and outsides of houses.

To the SPIDER.

Ingenious insect, but of ruthless mould,
Whose savage craft, as Nature taught, designs
A mazy web of death, the filmy lines,
That form thy circling labyrinth, enfold
Each thoughtless fly that wanders near thy hold,
Sad victim of thy guile; nor aught avail
His silken wings, nor coat of glossy mail,
Nor varying hues of azure, jet, or gold:
Yet though thus ill the fluttering captive fares,
Whom, heedless of the fraud, thy toils trepan;
Thy tyrant-fang, that slays the stranger, spares
The bloody brothers of thy cruel clan;
While *man* against his fellows spreads his snares,
Then most delighted when his prey is *man*.

RUSSELL.

The *iulus terrestris* appears, and the death-watch (*termes pulsatorius*) beats early in the month.

The wether's bell
Before the drooping flock tolled forth her knell;
The solemn *Death-watch* clicked the hour she died.

The wood-ant (*formica herculanea*) now begins to construct its large conical nest. The shell-snail comes out in troops; the stinging-fly (*conops calci-trans*) and the red-ant (*formica rubra*) appear. The mole cricket (*gryllus gryllotalpa*) is the most remarkable of the insect-tribe seen about this time. The black slug (*limax ater*) abounds at this season. The blue flesh-fly (*nausca vomitoria*), the cabbage butterfly (*papilio brassicæ* ¹), and the dragon-fly

¹ In again naming the butterfly, we cannot refuse to enrich our pages with a few lines from that elegant little poem, the '*Butterfly's Ball*.' It deserves a less perishable repository than that in which it first appeared:—

Come, take up your hats, and away let us haste
To the *Butterfly's* ball and the *Grasshopper's* feast:
The trumpeter *Gad-fly* has summoned the crew,
And the revels are now only waiting for you;

(*libellula*), are frequently observed towards the end of the month. The great variegated *libellula* (*libellula varia* of Shaw), which appears, principally, towards the decline of summer, is an animal of singular beauty.

Hark! the BEE winds her small but mellow horn,
 Blithe to salute the sunny smile of morn.
 O'er thymy downs she bends her busy course,
 And many a stream allures her to its source.
 'Tis noon, 'tis night. That eye so finely wrought,
 Beyond the search of sense, the soar of thought,
 Now vainly asks the scenes she left behind;
 Its orb so full, its vision so confined!
 Who guides the patient pilgrim to her cell?
 Who bids her soul with conscious triumph swell?
 With conscious truth retrace the mazy clue
 Of varied scents, that charmed her as she flew?
 Hail, Memory, hail! thy universal reign
 Guards the least link of Being's glorious chain.

ROGERS.

Some account of the habits and food of *caterpillars* has already been given in our last volume

On the smooth shaven grass by the side of a wood,
 Beneath a broad oak, which for ages had stood,
 See the children of earth, and the tenants of air,
 To an ev'ning's amusement together repair;

And there came the *Beetle*, so blind and so black,
 Who carried the *Emmet*, his friend, on his back;
 And there came the *Gnat* and the *Dragon-fly* too,
 And all their relations, green, orange, and blue;

And there came the *Moth*, with her plumage of down,
 And the *Hornet*, with jacket of yellow and brown,
 Who with him the *Wasp*, his companion, did bring,
 But they promised, that ev'ning, to lay by their sting;

Then the sly little *Dormouse* peeped out of his hole,
 And led to the feast his blind cousin the *Mole*;
 And the *Snail*, with her horns, peeping out of her shell,
 Came, fatigued with the distance, the length of an ell;

A *mushroom* the table, and on it was spread
 A *water-dock leaf*, which their table-cloth made;
 The viands were various, to each of their taste,
 And the *Bee* brought the honey to sweeten the feast.

(p. 124) ; we shall now continue the subject by presenting our readers with some observations on this curious insect by Sir John Hill.

‘ I was observing (says this eloquent writer), the other morning, the fate of a multitude of caterpillars, which were feeding as voluptuously on a cabbage-leaf at my foot, as myself was on the best produce of the garden where I accidentally saw them. While I was regarding them, with thoughts that every moment carried up my soul in praises to their and my Creator, my eyes were directed toward a part of the plant about which a little fly was buzzing on the wing, as if deliberating where it should settle. I was surprised to see the herd of caterpillars, creatures of twenty times its size, endeavour, in their uncouth way, by various contortions of their bodies, to get out of its reach, whenever it poised on the wing as just going to drop. At length the creature made its choice, and seated itself on the back of one of the largest and fairest of the cluster. It was in vain the unhappy reptile endeavoured to dislodge the enemy. Its contortions, which had at first been exerted with that intent, soon became more violent, and denoted pain. They had been repeated several times, at short intervals, when I at length observed that each of them was the consequence of a stroke given by the fly.

“ When the wantonly-cruel insect, as it might naturally enough have appeared to an unexperienced observer, had inflicted thirty or forty of these wounds, it took its flight, with a visible triumph. The caterpillar continued its contortions a long time ; but all efforts were vain to rid it of the mischief it had received. A prior acquaintance with the economy of this little world had informed me with the intent and end of all that had been doing : the wounds I knew were not given in sport ; but the creature that had inflicted them had deposited an egg in each, and there left them to their fate.

‘ I ordered a servant to take up the leaf, and, wiping off the other caterpillars that were feeding on it, conveyed it home with this wounded one upon it. The creature has been fed with care from that day, and I have had an opportunity of observing the progress of the eggs deposited in its body. They have all hatched with me into small oblong, voracious worms, which have fed, from the moment of their appearance, on the flesh of the caterpillar in whose body they found themselves inclosed, without wounding its organs of respiration or digestion, or any of the parts necessary to life: the unhappy creature has continued eating voraciously. They have, by this means, been supplied with sufficient nourishment, and, being now arrived at their full growth, and at the destined period of their first change, they are at this time eating their way out at the sides of the animal in which they have so long lived, and that with sure presage of its destruction.

‘ The caterpillar does not, under this circumstance, answer the general end of its existence: no butterfly can be produced from it; but it perishes, after having thus supported these strangers. One individual of a numerous species is thus lost, without answering the general end of the production; but, while multitudes of others miscarry under the same disadvantages, serving as food for birds, or sport of children, this gives the means of life to thirty or forty other animals, which could have no otherwise been brought into existence.

‘ The conclusion of the history is this: the worms that feed on the wretched creature are no sooner out of its body, than they spin every one its web, of a silk infinitely finer than that of the silk-worm; under this they pass the state of rest necessary to their appearing in their winged form.

‘ It may be natural enough for us to pity the caterpillar that supports this foreign brood at the expense of so much seeming pain; but things are

not always as they appear to us. The creature shows itself much at rest during their living in it; and till we are acquainted with its organs, and the nature of its sensations, we cannot be assured what may be the effects of that which we see it suffer.

‘He, whose tender mercies are over all his works, allotted all we see in this strange scene; and it is wisdom to suppose we are ignorant, while we know He cannot be cruel.’

River fish leave their winter retreats, and again become the prey of the angler:

In genial spring, beneath the quiv’ring shade
Where cooling vapours breathe along the mead,
The patient *fisher* takes his silent stand,
Intent, his angle trembling in his hand;
With looks unmoved, he hopes the scaly breed,
And eyes the dancing cork and bending reed.
Our plenteous streams a various race supply,
The bright-eyed *perch* with fins of Tyrian dye;
The silver *eel* in shining volumes rolled,
The yellow *carp* in scales bedropped with gold;
Swift *trouts*, diversified with crimson stains,
And *pikes*, the tyrants of the wat’ry plains.

POPE.

Happy ENGLAND! where the sea furnishes an abundant and luxurious repast, and the fresh waters an innocent and harmless pastime; where the angler, in cheerful solitude, strolls by the edge of the stream, and fears neither the coiled snake, nor the lurking crocodile; where he can retire at night, with his few trouts, to borrow the pretty description of old WALTON, to some friendly cottage, where the landlady is good, and the daughter innocent and beautiful; where the room is cleanly, with lavender in the sheets, and twenty ballads stuck about the wall! There he can enjoy the company of a talkative brother sportsman, have his trouts dressed for supper, tell tales, sing old tunes, or make a catch! There he can talk of the

See the Inspector, No. 64, or the same paper reprinted by Dr. Drake, in the Gleaner, vol. ii, p. 192.

wonders of NATURE with learned admiration, or find some harmless sport to content him, and pass away a little time, without offence to GOD, or injury to man !

The various employments of the '*Fisher Boy*,' in this month, are prettily narrated in the following lines :—

In APRIL, Ned oft hears the welcome call,
And gladsome flies to tend the wished-for haul¹ ;
O'er briny waves now undulates the boat,
Rides their curved tips—or sinks in peace to float.
A wat'ry mountain still succeeds, and now
Through the curled precipice glides on the bow,
While right and left the splashing surges rise,
And veil each object from the gazer's eyes ;
Ranged on the beach, at equal distance stand,
To haul each line, a motley lab'ring band ;
Men, women, children, draw the ropes amain,
And little Ned cries out—God speed our Seine² !
But as the floating corks approach³, so those
Employed at either rope run on to close ;

¹ ' This word is made use of to denote the drawing in of the net, which, when cast, they call Shooting the Seine.'

² ' On the western coast the net of the fisherman is technically called the *Seine* ; but on what account I have never been able to ascertain. The Seine and Seine-boat are of considerable value to the owner, being worth an hundred pounds, and upwards. The common Seine is 250 fathoms in length, or 500 yards ; but in the *mackerel* season they are 700 yards, and instances have been known of a net extending to 400 fathoms, or 800 yards.'

³ ' The Seine-boat having carried out the net to a certain distance, which depends entirely on the kind of fish they intend to haul, the Seine is then shot from the boat, which moves on, forming a circle, being supported by the floating corks affixed at equal distances to the ropes attached to the net. From each end of the Seine are cords extending to the beach, and which are there held by the persons stationed to haul the Seine, when completely cast into the sea ; these individuals form two rows, which gradually close as the net approaches the shore. I have frequently seen eighteen or twenty of the largest salmon, together with a variety of other fish, caught at one haul ; producing, when spread on the beach, an effect so beautiful, as to beggar all description.'

And now the twiny snare the beach bespreads,
 Tangled with sea-weeds, variegated shreds:
 At length, as nearer draws the finny weight,
 Each countenance betrays a mind elate;
 Feelings in turn resume their wonted scope,
 Now pallid fear pervades—now anxious hope.
 The Seine on shore, no fear Ned's joy controls,
 Who leaps to view a glorious haul of *soles*,
 With plenteous heaps of *whitings*, silv'ry skins,
 And their companions the cream-coated *blins*.
 The owner of the net's ¹ especial care,
 Is next to note down each assistant there;
 Another hand prepares to count the store,
 When sep'rate heaps of fish o'erspread the shore,
 Whose glitt'ring scales such varied ² tints impart,
 As bid defiance to the hand of art;
 For then in quick succession will arise,
 Pearls, di'monds, em'ralds, living to the eyes,
 The tint of roses mingling with the hue
 Of pansy, daffodil, and violet blue.
 And yet, poor harmless offsprings of the deep!
 For ye the liquid drops mine eyes ensteep,
 As writhing, I your tinselled forms behold,
 Your heaving gills, and eyes of blue and gold,
 Ring-like distended, and with glazy stare,
 Bent on high heav'n, with fixed and anguished glare;
 Dulness at length each brilliant orbit shades,
 For gold and azure, misty film pervades;
 Thus death approaching, veils the sparkling sight,
 And closes in proportion life and light³.

¹ 'Any fisherman possessing a Seine, is denominated the *Owner*, or *Muster*, and is regarded as a wealthy man in such small villages, where the value of the net is deemed a little fortune.'

² 'It is absolutely impossible to witness the dying agonies of these variegated and beautiful creatures, without yielding to the most painful emotions; and when the eye is led to contemplate the diversity and brightness of the colouring they assume, while in their last moments, it is apparent that their corporeal sufferings must be of the most acute kind. It is scenes like these that afford an ample field for the gluttonous appetite of the Hollander, so partial to the finny race, who, although accustomed to kill the fish the moment they are caught, is led to this apparent meritorious conduct from a desire to pamper his own appetite, and not from any sentiment of feeling towards the suffering animal.'

³ See the pleasing poem of the 'FISHER BOY,' pp. 20-24.

Dry weather is still acceptable to the farmer, who is employed in sowing various kinds of grain, and seeds for fodder, as buck-wheat, lucerne, saintfoin, clover, &c. The young corn and springing-grass, however, are materially benefited by occasional showers.

The barbarity of *shooting hares* at this season, a circumstance, we trust, but of rare occurrence, as these interesting animals are now with young, has given birth to a beautiful little poem by the bard who must ever be remembered as 'Scotland's glory and her shame.' He thus feelingly alludes to the circumstance:—'One morning lately, as I was out pretty early in the fields sowing some grass-seeds, I heard the burst of a shot from a neighbouring plantation, and presently a poor little wounded hare came crippling by me. You will guess my indignation at the inhuman fellow who could shoot a hare at this season, when they all of them have young ones. Indeed there is something in that business of destroying, for our sport, individuals in the animal creation that do not injure us materially, which I could never reconcile to my ideas of virtue.'

On seeing a Fellow wound a Hare with a Shot, April 1769.

Inhuman man! curse on thy barb'rous art,

And blasted be thy murder-aiming eye!

May never pity soothe thee with a sigh,

Nor ever pleasure glad thy cruel heart.

Go live, poor wanderer of the wood and field,

The bitter little that of life remains;

No more the thickening brakes or verdant plains

To thee a home, or food, or pastime yield.

Seek, mangled innocent, some wonted form,

That wonted form, alas! thy dying bed,

The sheltering rushes whistling o'er thy head,

The cold earth with thy blood-stained bosom warm.

Perhaps a mother's anguish adds its woe;

The playful pair croud fondly by thy side:

Ah! helpless nurslings, who will now provide

That life a mother only can bestow¹?

¹ See Robert Burns's Works, vol. ii, p. 229, 8vo edit, 1809.

The spring flight of pigeons (*columbæ*) appears in this month, or early in the next. Pigeons are very prolific; they have but two at a time, and will breed seven or eight times in the year: the species called *monthly pigeons* produce young ones almost every month. From one pair of these birds it is computed, that, if properly managed, the astonishing number of 14,760 may be obtained in the course of four years. Mr. Gooch, in his Agricultural Survey of Cambridgeshire (p. 284), says, that, in that county, ‘many dove-houses produce annually one hundred dozen young pigeons, which sell from 2s 6d to 5s per dozen; the produce, however, varies much, and in some instances amounts to a trifle.’ One hundred dozen, at 5s the dozen, would yield the great sum of £300. Pigeons, when they first come in, sell sometimes at 15 and 18 pence a-piece.

The *stock-dove*, or original of the genus *columba*, in its natural or wild state, is of a deep blue and ash colour; the breast darked with a fine changeable green and purple; the sides of the neck of a reddish gold colour; its wings marked with two black bars, one on the quill feathers, and the other on the covert; the back white, and the tail barred near the end with black. The *ring-dove* is yet held by naturalists to be distinct from the stock-dove, and it would seem that the *turtle-dove* is equally so from both.

In this country, the *blue dove-house pigeon* is the most common, and the only *wild species* are the ring-doves, or wood pigeons, and the turtle-doves, which are to be found in all parts of South Britain, breeding during the spring and summer, and retiring to the deepest recesses of the woods in the winter season; whence, probably, the turtle has been supposed to emigrate.

But both in the antient and modern world, this beautiful and variegated genus of birds has been cherished by man, as a source of amusement and of

gratification to the eye, as well as of profit in the article of provision for the table. Among certain of the nations of antiquity, however, pigeons were held sacred, and their lives no one dared assail. The useful qualification of *messenger*, appertaining to the Asiatic and African species of the pigeon, is of high antiquity; and we read, in the time of the Crusades, of an Arabian prince, who had a sort of telegraphic communication kept up, in his dominions, through the instrumentality of pigeons, which carried letters, and were regularly relieved at the appointed posts. From those, doubtless, the breed celebrated in Europe under the name of the *carrier* has proceeded.

In modern times, those varieties which are kept for the purposes of amusement and show, are styled *fancy breeds*, and they form a distinct article of commerce in cities and great towns, the varieties, as they chance to be in fashion, bringing a considerable price. In London, the pigeon-fanciers immemorably, we believe, have had a club, in which premiums are awarded, and the notable science of the fancy, through the medium of crossing colours and forms, is promoted and perpetuated. The chief objects of the fancy have hitherto been those varieties styled *almond* (probably *ermine*); *tumblers*, *carriers*, and the birds with great crops, the most fashionable variety of which is the *pouting horseman*. The specific merits of these breeds are indicated by their names. The tumbler exercises that faculty in the air, but is chiefly valued for his peculiar form and variegated plumage. The carrier, as a messenger, cuts the air with almost inconceivable swiftness. The pouter distends his crop to a size attractive to curiosity, and, by his grotesque attitudes and familiarity with man, engages his attention. Half a century ago, the pigeon fancy was in higher estimation and prosperity than at present; and the almond tumbler was then in the greatest vogue, such sums, probably, as

twenty or thirty guineas each being the price of superior cocks of that breed, such as, at the present time, would not produce more than five.—(See *Mr. Bonington Mowbray's Practical Treatise on Domestic Poultry*, &c. p. 178, second edition.)

As a pleasing supplement to the Diary for the present month, we add Mr. Jago's beautiful Elegy of the 'SWALLOWS,' as it will, probably, be new to many of our readers, and, we trust, agreeable to all. 'The ingenious and benevolent writer (says Dr. Aikin¹), who, in his Elegies of the *Goldfinches* and *Blackbirds*, has pathetically pleaded the rights of humanity with respect to the feathered race, in *this piece*, from that providential instinct which incites the *swallow tribe* to launch fearless on the unbounded sky in quest of a retreat from the storms of winter, deduces with persuasive energy the reasonableness of a confidential reliance on the same Providence, in our flight from the stormy regions of this life to a peaceful futurity.

'A fine vein of descriptive poetry is intermixed with the moral sentiment of this little piece, so that he has shown himself an elegant observer of nature, as well as a forcible preacher. The *return of the swallows*, in particular, is beautifully painted, and nothing can be better imagined, or more consonant to the natural history of these birds, than their supposed conversation.

'I cannot but attribute a degree of merit to this poem, higher than its mere poetical excellence might claim, on account of its being the model of a new combination of moral precept with natural description, greatly superior, in many respects, to fable.'

¹ Essay on the Application of Natural History to Poetry, p. 100.

The SWALLOWS; an ELEGY.

PART I.

Ere yellow Autumn from our plains retired,
And gave to wintry storms the varied year,
The Swallow-race with prescient gift inspired,
To southern climes prepared their course to steer.

On Damon's roof a large assembly sate,
His roof a refuge to the feathered kind !
With serious look he marked the grave debate,
And to his Delia thus addressed his mind :

' Observe yon twittering flock, my gentle maid,
Observe, and read the wondrous ways of Heav'n !
With us through Summer's genial reign they stayed,
And food and sunshine to their wants were giv'n.

' But, now, by secret instinct taught, they know
The near approach of elemental strife,
Of blustering tempests, and of chilling snow,
With every pang and scourge of tender life.

' Thus warned, they meditate a speedy flight,
For this ev'n now they prune their vigorous wing,
For this each other to the toil excite,
And prove their strength in many a sportive ring.

' No sorrow loads their breast, or dims their eye,
To quit their wonted haunts, or native home ;
Nor fear they launching on the boundless sky,
In search of future settlements to roam.

' They feel a power, an impulse all divine,
That warns them hence, they feel it and obey ;
To this direction all their cares resign,
Unknown their destined stage, unmarked their way.

' Peace to your flight ! ye mild, domestic race :
O ! for your wings to travel with the sun !
Health brace your nerves, and zephyrs aid your pace,
Till your long voyage happily be done.

' See, Delia, on my roof your guests to-day ;
To-morrow on my roof your guests no more ;
Ere yet 'tis night, with haste they wing away,
To-morrow lands them on some happier shore.'

How just the moral in this scene conveyed !
And what, without a moral, would we read ?
Then mark what Damon tells his gentle maid,
And with his lesson register the deed.

So youthful joys fly like the Summer's gale,
 So threats the winter of inclement age;
 Life's busy plot a short fantastic tale!
 And Nature's changeful scenes, the shifting stage!
 And does no friendly Power to man dispense
 The joyful tidings of some happier clime?
 Find we no guide in gracious Providence,
 Beyond the gloomy grave and short-lived time?
 Yes, yes; the sacred oracles we hear
 That point the path to realms of endless joy,
 That bid our trembling hearts no danger fear,
 Though clouds surround, and angry skies annoy.
 Then let us wisely for our flight prepare,
 Nor count this stormy world our fixed abode;
 Obey the call, and trust our Leader's care,
 To smooth the rough and light the darksome road.
 Moses, by grant divine, led Israel's host
 Through dreary paths to Jordan's fruitful side;
 But we a loftier theme than theirs can boast—
 A better promise, and a nobler guide.

PART II.

At length the Winter's howling blasts are o'er,
 Arrayed in smiles the lovely Spring returns;
 Now fuelled hearths attractive blaze no more,
 And every breast with inward fervour burns.
 Again the daisies peep, the violets blow,
 Again the vocal tenants of the grove
 Forgot the pattering hail or driving snow,
 Renew the lay to melody and love.
 And see, my Delia, see o'er yonder stream,
 Where on the bank the lambs in gambols play;
 Alike attracted by the sunny gleam,
 Again the Swallows take their wonted way.
 Welcome, ye gentle tribe, your sports pursue,
 Welcome again to Delia, and to me;
 Your peaceful councils on my roof renew,
 And plan new settlements from danger free.
 Again I'll listen to your grave debates,
 Again I'll hear your twittering songs unfold
 What policy directs your wandering states,
 What bounds are settled, and what tribes enrolled.

Again I'll hear you tell of distant lands,
What insect-nations rise from Egypt's mud,
What painted swarms subsist on Lybia's sands,
What Ganges yields, and what th' Euphratean flood.

Thrice happy race ! whom Nature's call invites
To travel o'er her realms with active wing,
To taste her various stores, her best delights,
The Summer's radiance, and the sweets of Spring ;

While we are doomed to bear the restless-change
Of varying seasons, vapours dank and dry,
Forbid, like you, in milder climes to range,
When wintry storms usurp the lowering sky.

Yet know the period to your joys assigned,
Know ruin hovers o'er this earthly ball ;
As lofty towers stoop prostrate to the wind,
Its secret props of adamant shall fall.

But when yon radiant sun shall shine no more,
The spirit, freed from sin's tyrannic sway,
On lighter pinions borne than yours, shall soar
To fairer realms beneath a brighter ray,

To plains ethereal, and celestial bow'rs,
Where wintry storms no rude access obtain,
Where blasts no lightning, and no tempest low'rs,
But ever-smiling Spring and Pleasure reign.

JAGO.

MAY.

MAY is so called from *Maia*, the mother of Mercury, to whom sacrifices were offered by the Romans on the first of this month ; or, according to some, from respect to the senators and nobles of Rome, who were named *Majores*, as the following month was termed Junius, in honour of the youth of Rome. The Saxons called May, *tri-milki*, because, in that month, they began to milk their kine three times in the day.

Remarkable Days.

1.—MAY-DAY.

ANTIENTLY, all ranks of people went out a may-ing early on the first of this month. 'The juvenile part of both sexes, in the north, were wont to rise a little after midnight, and walk to some neighbouring wood, accompanied with music and the blowing of horns; where they break down branches from the trees, and adorn them with *nosegays* and *crowns of flowers*. When this is done, they return with their booty homewards, about the rising of the sun, and make their doors and windows to triumph in the flowery spoil. The after part of the day is chiefly spent in dancing round a tall pole, which is called a *May-pole*; which being placed in a convenient part of the village, stands there, as it were, consecrated to the *goddess of flowers*, without the least violation offered it, in the whole circle of the year.'

The custom of *going a maying* is now confined wholly to the populace; and the 'milk-maids' garland' and 'chimney-sweepers' dance' are the most remarkable features of this annual celebration.

But even these amusements are very much upon the decline, both in town and country, and promise to be, in a few years, quite extinct. We may, indeed, already say, with the poet—

No more in choral bands unite
Her virgin vot'ries, and at early dawn,
Sacred to MAY and Love's mysterious rite,
Brush the light dew-drops¹ from the spangled lawn.

To her no more AUGUSTA'S² wealthy pride
Pours the full tribute from POROSI'S mine;
Nor fresh-blown garlands village maids provide,
A purer offering at her rustic shrine.

¹ Alluding to the country custom of gathering May-dew.

² The plate-garlands of London.

No more the MAYPOLE's verdant height around
 To valour's games th' ambitious youth advance;
 No merry bells and tabors' sprightlier sound
 Wake the loud carol and the sportive dance.

1.—SAINT PHILIP AND SAINT JAMES THE LESS.

Philip was born at Bethsaida, near the sea of Tiberias, the city of Andrew and Peter. He was one of the first disciples, and an apostle. James the Less, called also *James the Just*, and, by the apostle Paul, *James*, the Lord's brother, was the son of Joseph, afterwards husband to the Virgin Mary, as is probable by his first wife. The first of these martyrs was stoned to death, and the second, having been thrown from a high place, was killed by a fuller's staff.

*1. 1769.—DUKE OF WELLINGTON BORN.

*2. 1816.—PRINCESS CHARLOTTE MARRIED.

Father of Mercies! bless,
 Prosper with happiness,
 The Royal Pair;
 Viewed with admiring gaze,
 Cheered by a Nation's praise,
 Crown them with length of days;
 Grant Britain's prayer!

3.—INVENTION OF THE CROSS.

The Romish Church celebrates this day as a festival, to commemorate the *invention* or finding of a wooden cross, supposed to be the *true one*, by Helena, the mother of Constantine the Great.

6.—JOHN EVANGELIST, A. P. L.

John the Evangelist was a Galilean by birth, the son of Zebedee and Salome, the younger brother of James, but not of him that was surnamed the Just, and who was the brother of our Lord. Being carried prisoner to Rome, he was condemned to be thrown into a cauldron of boiling oil, but was miraculously preserved, and came out of it alive. He survived to the reign of Trajan, and died about ninety years of age.

*10. 1796.—ROBERT LOVELL DIED.

Written on a Journey.

As o'er the lengthened plain the traveller goes,
 Weary and sad, his wayward fancy strays
 To scenes which late he passed, haply to raise
 The transient joy which memory bestows;
 And oft, while hope dispels the gathering gloom,
 He paints th' approaching scene in colours gay:
 So I, to cheer me in life's rugged way,
 Or glance o'er pleasures past, or think of bliss to come.
 But, ah! reflection vainly we employ
 On pleasures past, and fugitive the joy
 When the mind rests on hope's delusive power;
 Blessed only they who present joys can taste,
 Nor fear the future, nor regret the past,
 But happy, as it flies, enjoy the present hour.

LOVELL.

11.—ROGATION SUNDAY.

This day takes its name from the Latin term *rogare*, to ask; because, on the three subsequent days, *supplications* were appointed by Mamertus, Bishop of Vienna, in the year 469, to be offered up with fasting to God, to avert some particular calamities that threatened his diocess.

*14. 1610.—HENRY IV OF FRANCE ASSASSINATED.

15.—ASCENSION DAY.

From the earliest times, this day was set apart to commemorate our Saviour's ascension into heaven: all processions on this, and the preceding rogation days, were abolished at the reformation. In London, on this day, the minister, accompanied by the churchwardens, and a number of boys, with wands, walk in procession, and *beat the bounds* of the parish. But this is not always practised, nor in every year.

19.—SAINT DUNSTAN.

Dunstan was a native of Glastonbury, and nobly descended. He was a skilful painter, musician, and an excellent forger and refiner of metals: he manufactured crosses, vials, and sacred vestments; and also painted and copied good books. He was Bishop

M

of London, and afterwards Archbishop of Canterbury. He died in 988.

***19. 1744.—QUEEN CHARLOTTE BORN.**

Her present Majesty (Princess Charlotte of Mecklenburgh Strelitz) was born on this day, but her birthday is celebrated on the 18th of January.

25.—WHIT-SUNDAY.

On Whit-Sunday, or *White-Sunday*, the *catechumens*, who were then baptized, as well as those who had been baptized before at Easter, appeared, in the ancient church, in *white garments*; hence the name.

The celebration of divine service in St. Peter's church at Rome, on Whit-Sunday, is described in T. T. for 1815, p. 165.

***25. 1805.—ARCHDEACON FAHEY DIED.**

26, 27.—WHIT-MONDAY AND WHIT-TUESDAY.

In 'ancient times' Whitsun Plays were acted at this season. At Chester, these plays were twenty-five in number, and were performed for above three centuries, annually. In the year 1600, they were enacted by the craftsmen of the twenty-five companies, who were all dressed in suitable habits. The subjects were taken from the Scriptures.

In 'modern times,' other 'plays' and 'pastimes,' 'the subjects not taken from the Scriptures,' are enacted in Greenwich Park and the vicinity; not often, we fear, to the advantage of the performers.

The Whitsun Ales, and other customs formerly observed at this season, are noticed at length in our former volumes.

Every third year, on Whit-Tuesday, the *Montem* at Eton is celebrated. It consists of a procession to a small tumulus on the southern side of the Bath road, which has given the name of Salt Hill to the spot, now better known by the splendid inns that are established there.—See T. T. for 1815, p. 168.

26.—AUSTIN.

This *English apostle*, as he is termed, was commissioned by Pope Gregory the Great to convert the Saxons. He was created Archbishop of Canterbury in 556, and died about the year 610.—(See T. T. for 1815, p. 174.)

27.—VENERABLE BEDE.

Bede was born at Yarrow in Northumberland, in 673.

29.—KING CHARLES II RESTORED.

On this day, in the year 1660, he made his magnificent entry into London. It is also his birthday.

In some parts of England it is customary for the common people to wear oak leaves, covered with leaf-gold, in their hats, in commemoration of the concealment of Charles II in an oak tree, after the battle of Worcester. To this tree, not far from Boscobel House, the king and his companion Colonel Careless resorted, when they thought it no longer safe to remain in the house; climbing up by the hen-roost ladder, and the family giving them victuals on a nut-hook.

The following fine moral stanzas are said to have been a favourite song of Charles II:—

The glories of our blood and state
Are shadows, not substantial things;
There is no armour against fate;
Death lays his icy hands on kings:
Sceptre and crown
Must tumble down,
And in the dust be equal made
With the poor crooked scythe and spade.
Some men with swords may reap the field,
And plant fresh laurels where they kill;
But their strong nerves at last must yield,
They tame but one another still.
Early or late,
They stoop to fate,

And must give up their murmuring breath,
When they pale captives creep to Death.

The garlands wither on your brow ;
Then boast no more your mighty deeds :

Upon Death's purple altar now
See where the victor victim bleeds :

All heads must come

To the cold tomb :

Only the actions of the just
Smell sweet and blossom in the dust.

*30. 1431.—JOAN D'ARC BURN'T.

Astronomical Occurrences

In MAY 1817.

THE Sun enters Gemini on the 21st of this month, at 53 m. past 11 in the forenoon. The Sun will be eclipsed on the morning of the 16th, but the eclipse will not be visible in this country. He will be centrally eclipsed on the meridian at 18h. 53' $\frac{2}{10}$, on the 15th, astronomical time, in longitude 76° 31' $\frac{1}{2}$ east, and latitude 6° 36' $\frac{1}{4}$ north. The time of the Sun's rising and setting for every 5th day of the month, is exhibited by the following

TABLE.

Thursday, May 1,	Sun rises 37 m. after 4,	Sets 23 m. after 7
Tuesday, — 6,	. . . 28 . . . 4 . . . 32 . . . 7	
Sunday, — 11,	. . . 20 . . . 4 . . . 40 . . . 7	
Friday, — 16,	. . . 12 . . . 4 . . . 48 . . . 7	
Wednesday, — 21,	. . . 5 . . . 4 . . . 55 . . . 7	
Monday, — 26,	. . . 59 . . . 3 . . . 1 . . . 8	
Saturday, — 31,	. . . 54 . . . 3 . . . 6 . . . 8	

The following Table shows what is to be subtracted from the time shown by a good sun-dial to obtain true or mean time on every 5th day of the present month ; and for the method of finding the quantity for any intermediate day, see Occurrences for the first month of the present year.

TABLE.

	m.	s.
May 1, from the time on the dial subtract	3	3
6,	3	36
11,	3	54
16,	3	57
21,	3	46
26,	3	22
31,	2	46

The full of the Moon will take place on the 1st of this month, at 33 m. past 7 in the morning; her last quarter will commence at 39 m. after 3 on the morning of the 8th; and there will be a new Moon at 7 in the morning of the 16th. She will enter her first quarter 42 m. past 12 at night on the 23d; and she will be at full again at 21 m. past 3 in the afternoon of the 30th.

The Moon may be seen on the *first* meridian of this country at the following epochs, viz.

6th day, at 44 m. past 4 in the morning
26th . . . 39 . . . 8 in the evening
27th . . . 30 . . . 9
28th . . . 24 . . . 10
29th . . . 21 . . . 11

On the 28th of the present month, the Moon will eclipse the star α in Libra; the immersion will take place at $2\frac{1}{4}$ m. past 9 in the evening, and the emersion at $4\frac{3}{4}$ m. after 10; and consequently the duration of the eclipse will be 1 h. $2\frac{1}{2}$ m. At the time of the immersion, the star will be $10\frac{3}{4}$ m. south of the Moon's centre; and at the emersion, $3\frac{1}{4}$ m. south of the same point. On the 18th, at 5 m. past 7 in the morning, the Moon and Mercury will be in conjunction; and on the 19th, Mercury will be at his greatest elongation. On the 21st, at midnight, Venus will be in her inferior conjunction. At 20 m. after 10 on the morning of the 27th, Saturn will be in quadrature; and at 45 m. past 4 in the afternoon of the same day, Jupiter will be in opposition.

The following visible eclipses of Jupiter's first and

second satellites will also take place during the present month, viz.

IMMERSIONS.

1st Satellite, May 2,	m.	38	after	2	in the morning.
. — 10,		1	after	11	in the evening.
. — 17,		55	after		midnight.
. — 25,		50	after	2	in the morning.
. — 26,		18	after	9	at night.
2d Satellite, — 18,		31	after	11	at night.
. — 26,		5	after	2	in the morning.

The eclipses of satellites make known the instants of their oppositions to the Sun; the interval between two eclipses gives the *synodic revolution* of the satellite; from which astronomers conclude its angular motion, with respect to the axis of the shadow or the line which joins the centres of the planet and the Sun. Then the motion of the planet about the Sun being known, they deduce from this result the length of the *sidereal revolution*. In order to ensure a greater degree of accuracy, they employ those eclipses that were observed near the oppositions of the planet, when it is found nearly in the same right line with the earth and the Sun; and to compensate for the inequalities that may take place in the movements of the satellite and the planet, care is taken to compare such eclipses as are remote from each other.

Observation has shown that the orbits of the satellites are very nearly circular; and therefore their distances from the principal planet may be ascertained by measuring them with a micrometer at the time of their *greatest elongation*. Then, by comparing these distances with the times of their sidereal revolutions, it has been found that Kepler's law for the planets holds good for the satellites also, viz. that, in each system, *the squares of their revolutions are as the cubes of their mean distances*.

The frequent eclipses of Jupiter's satellites have furnished astronomers with the means of examining their motions with much greater accuracy than they could have done merely by observations of their dis-

stances from the primary planet; for these distances are always extremely small, and their variations very difficult to be perceived.

The greater or less duration of the successive eclipses of the same satellite, and the series of positions in which they happen, make known the inclination of its orbit and the position of its nodes upon the plane of the orbit of the planet. Observations of Jupiter's satellites have also led to the discovery of another very remarkable phenomenon of nature; the *successive transmission of light*. By comparing the returns of these eclipses, it is seen that, when Jupiter is in opposition to the Sun, they happen sooner than they ought to do according to the calculations, from the sidereal revolutions of the satellites. On the contrary, towards the conjunctions, when Jupiter is beyond the Sun with respect to the earth, they take place after the calculated time; and these variations are exactly the same for all the satellites, and cannot be attributed to any inequalities in their movements; for, by the effect of Jupiter's motion, the conjunctions and oppositions answer successively to different points of the heavens. The same thing also takes place with respect to the eclipses of the satellites and their orbits. What presents itself as the most simple and easy explanation of this observed fact, is, that the light of the Sun reflected by these small bodies is not suddenly transmitted to the earth, but requires a sensible time to traverse the space between the satellite and us. Indeed, if the orbit of Jupiter be concentric with the Sun, and the phenomena of his movement leave no reason to doubt it, this planet is much nearer to us in his oppositions than in his conjunctions. Supposing, for the sake of greater simplicity, that the orbit of Jupiter is circular, we perceive that the difference is double the radius of the apparent orbit of the Sun; which is sufficient to account for the retardations which observation points out.

The eclipses which happen near the conjunctions take place about $16' 26''$ after those which occur near the oppositions; hence light employs that time to traverse the solar orbit, and, consequently, it requires only half that interval to come from the Sun to us. Observations agree so well with hypothesis in this respect, that they answer as fully and completely as possible.

The observations of Jupiter's satellites are also extremely useful in finding the longitude at land. The rapid motion of these bodies causes frequent eclipses, the epochs of which are previously calculated, and entered in *Ephemerides*. The Tables of Jupiter's satellites, constructed by Delambre, according to the theory of Laplace, and after a great number of observations, leave little to be desired on this subject. By comparing the epochs calculated for the first meridian with the results of immediate observations made in another place, at a determined time, the difference of longitude may be concluded for this time. The method is the same as for eclipses of the Moon; but, unfortunately, it cannot be employed at sea. The telescopes necessary for observing these small bodies are too long to be used on board a ship, on account of the instability of the vessel; but these observations may be very useful to the navigator when in harbour.

On Parallax.

[Concluded from p. 105.]

FROM what has been previously stated, It is evident that the whole problem is reduced to that of determining the horizontal parallax; for it is easy to perceive, from an inspection of the triangle $CS'O$, that the sine of this parallax is equal to $\frac{CO}{CS'} = \frac{r}{D}$, where r is the terrestrial radius,

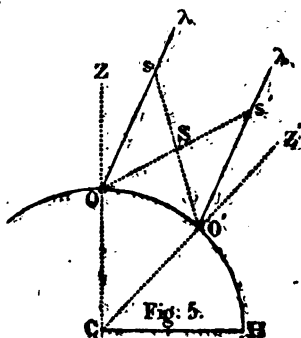
and D the distance of the body. If, therefore, this distance can be ascertained in terms of the radius, the parallax will be completely determined. The process for accomplishing this is at once simple and natural; and is nothing more than an application of the principles of trigonometry in precisely the same manner as in finding the distance of an inaccessible object, by taking the angles it makes with a given line at the two extremities of a known base. If two observers, situated at O and O' , fig. 3, at a known distance from each other, and under the same celestial meridian, observe, at the same instant, the altitude of the body S' , or its zenith distance, then, in the quadrilateral $S'OCO'$, there will be known the three angles O , C , and O' , and the two equal sides OC and $O'C$, which are the radii of the earth. Hence the diagonal CS' , which is the distance of the body, may readily be found by calculation; and the radius of the earth being divided by this distance, gives the horizontal parallax required.

The calculation which results from this method, and is necessary for finding the horizontal parallax, is stated by M. Biot in the following terms, and is remarkable for its simplicity:—

The horizontal parallax is equal to the angle at the body, divided by the sum of the sines of the zenith distances, if the body be situated between the zeniths of the two observers; or by the difference of these sines, if the body be found on the same side of both their zeniths.

Astronomers, however, frequently make use of another method of finding the parallax by observation; which is that of determining the angle $OS'O'$ immediately from the differences of the observed declination of the same star and the heavenly body; and these, it should be remarked, are susceptible of being observed with great accuracy. The following explanation will enable the astronomical student to

understand this method: Let λ be a star (fig. 5) which passes the meridian at the same time with the



body; and suppose two visual rays to be drawn from the observers to the star, which may be regarded as parallel to each other, since the parallax of the stars is insensible (see the preceding Note). Suppose, likewise, two other visual rays to be drawn through the body to meet these to the star in s and s' , as in the figure; then the angles $SO\lambda$ and $SO'\lambda$ are evidently the differences of the observed declination; and the angle OSO' , being the exterior angle of the triangle SOs , will be equal to the sum of these differences. But if the body was on the same side of the zenith with respect to both the observers, the angle OSO' would be equal to the difference of the same angles, $SO\lambda$ and $SO'\lambda$.

In the above case, it has been supposed, for the sake of making the illustration more easy and simple, that the two bodies passed the meridian of the observers at the same time; but this is not necessary in practice, provided they be chosen very nearly on the same parallel, and their difference of declination taken with a simple micrometer.

The following is an example in which this method was put in practice by *Lacaille* and *Wargentin*, in

their comparison of the planet Mars with the star A in Aquarius. Mars being on the meridian of the Cape of Good Hope, Lacaille found that his zenith distance was $25^{\circ} 2'$, and the northern limb of his disc $26''.7$ north of the star. At the same time, and under the same meridian, Wargentin observed Mars on the meridian at Stockholm, and found his zenith distance equal to $68^{\circ} 14'$, and the same part of his disc south of the star $6''.6$. The angle formed at Mars by the two visual rays from the observers, was therefore $26''.7 + 6''.6 = 33''.3$. Now the natural sine of $68^{\circ} 14'$ is 0.9287, and that of $25^{\circ} 2'$ is 0.4281, and their sum is 1.3518. This is the denominator, according to the above rule, and $33''.3$ is the numerator. Hence the horizontal parallax of Mars, according to these observations, is $\frac{33''.3}{1.3518} = 24''.64$.

The numerator in this expression being so very small, it is not essential to have the sines of the zenith distances to the greatest degree of accuracy, and consequently the zenith distances themselves; and it is this which constitutes the advantage of this method.

The circumstance of the two observers being on the same meridian, appears at first greatly to limit the use of this method; but this may be avoided by observing the meridian altitude of the heavenly body for several successive days, from which its diurnal change in declination will be determined. Then if the observers are not under the same meridian, the change in the declination of the body during the time elapsed between its passage over the two meridians may be easily calculated, and the two observations referred to the same meridian by means of the result, and the parallax concluded as above. It was by a similar method that the parallax of the Moon was determined, by comparing the observations of Lacaille, at the Cape of Good Hope, with those of Lalande, at Berlin.

The parallax of the Sun, however, is so small, on

account of his distance, that none of the preceding methods will give it with sufficient accuracy, and it long exercised all the ingenuity of astronomers in ascertaining it. This, however, has now been found to be about $8''.78$; but we must omit any account of the method employed till we have an opportunity of explaining the elements from which it is deduced.

In the preceding observations, the earth has been considered as spherical, and the distance of the body of which the parallax was to be found as constant; but if either of these be subject to variation, the parallax will also be variable. And it is now generally admitted that the labours of astronomers have fully proved the equatorial diameter of the earth to be greater than the polar axis by about $\frac{1}{310}$ th part of the former; and therefore the horizontal parallax at the equator exceeds that at the poles in the same ratio.

The greatest parallax is that of the Moon, which, under the equator, is about 1° , or $3600''$. Therefore, by taking the 309th part of this quantity, we shall have $11''.6$ for the excess of the one above the other. For all intermediate latitudes the difference of the radii is less, and the parallax varies as the square of the sine of the latitude. But this difference, though very small, may have a considerable influence on various astronomical phenomena; upon the time of an occultation of a star by the Moon, for example, or even upon its possibility. It is, therefore, necessary to take it into the account in all delicate calculations.

Since parallax depresses the true places of the celestial bodies, it not only diminishes their altitudes, but alters both their horary angles and their polar distances. The changes which it produces in these elements constitute what astronomers denominate *parallax of right ascension* and *parallax of declination*. These may both be readily deduced from the parallax of altitude: but our limits will not permit us to enter into an explanation of the method at present.

The following easy and practical rule will give the parallax of the Moon for any required altitude, corresponding to the mean temperature and pressure of the atmosphere, when the horizontal parallax is known; and this may be obtained for every day at noon and midnight from the Nautical Almanack for the year.

Add the logarithmic sine of the horizontal parallax and the logarithmic cosine of the Moon's altitude together, omitting 10 in the index, and the sum will be the logarithmic sine of the parallax corresponding to that altitude.

The following example will make the rule still clearer.

Required the Moon's parallax answering to 30° of altitude, the horizontal parallax at the time being $55'$.

$$\text{Log. sine } 55' = 8.9040703$$

$$\text{Log. cosine } 30^{\circ} = 9.9375306$$

$$\text{Parallax required } 47' 38'' = 8.1416009$$

The Naturalist's Diary.

It is the season sweet, of budding leaves,
Of days advancing tow'ards their utmost length,
And small birds singing to their happy mates.

THIS month is usually considered as the most delightful of the whole year, and has long been the Muse's favourite theme; although much that is said of its beauties applies better to more southern climates, or, indeed, to our month of JUNE, which is, commonly, entitled to all the praises that the poets have lavished upon MAY. This month, however, is remarkable for the profusion of verdure which it exhibits: nature's carpet is fresh laid, and nothing can be more grateful than to press its velvet surface.

The scenery of a May morning is, not unfrequently, as beautiful as possibly can be conceived; a serene sky,

The simple ayre, the gentle warbling winde,
So calm, so coole—

N.

a refreshing fragrance arising from the face of the earth, and the melody of the feathered tribes, all combine to render it inexpressibly delightful, to exhilarate the spirits, and call forth a song of grateful adoration.

Behold the merry minstrels of the morn,
The swarming songsters of the careless grove,
Ten thousand throats that from the flowering thorn
Hymn their good God, and carol sweet of love,
Such grateful, kindly raptures them remove:
They neither plough nor sow; ne, fit for flail,
Ere to the barn the nodden sheaves they drove,
Yet theirs each harvest, dancing in the gale,
Whatever crowns the hill, or smiles along the vale.

THOMSON.

This delightful picture, however, is in our northern climate confined, but too often, to a few days of the month; or sometimes, indeed, not realized till June or July; this was particularly the case with the very backward spring of the past year; when May might, with great truth, have been addressed in the language of an anonymous poet:

Why com'st thou, gentle May, with driving rain,
And chilly blasts, to check the opening year?
Why roll thy shadows o'er the gloomy plain?
Why frown in sullen sadness, dark and drear?

I have not seen the radiant orb of day
Beam his glad radiance on the dewy flower;
Nor, since I welcomed the return of May,
Known the mild influence of one sunny hour.

The time has been, when I was wont to hail,
With infant joy, the merry month of May;
When, loitering careless o'er the quiet vale,
In happiness and peace I passed the day.

O MAY! like thee, my spring of life I know!
Soon shall the storm each bud of promise blast!
Reflection rudely wakes, and wakes to woe,
And all the day-dreams of delight fly fast.

Spring, however late may be its approach, is rendered doubly welcome by the anxiety with which we have expected her,—and the clouds and storms that

have preceded this flower-crowned lady, like the misfortunes and disappointments of life, have only served to make its enjoyments more intensely felt. Light and shade constitute the harmony of the moral, as well as of the physical, world. We cordially hail this season with Mr. WILSON, in his beautiful 'Hymn to Spring:—

Thou canst not at last, and such a heavenly smile
Shone round thee, as beamed the eldest-born
Of Nature's guardian spirits. The great Son,
Scattering the clouds with a resistless smile,
Came forth to do thee homage; a sweet hymn
Was by the low winds charmed in the sky;
And when thy foot descended on the earth,
Scarce could they move amid the clustering flowers
By Nature strewn o'er valley, hill, and field,
To hail her blest deliverer!

The latest species of the summer birds of passage arrive about the beginning of this month. The goatsucker, or fern-owl (*caprimulgus Europæus*), makes its appearance only in the dusk of the evening, to search for prey, uttering a dull jarring noise. The spotted fly-catcher (*muscipala grisola*), the most mute and familiar of all our summer birds, builds in a vine or sweet-brian, against the wall of a house, or on the end of a beam, and sometimes close to the post of a door. The sedge-bird (*motacilla saticaria*) is found in places where reeds and sedges grow, and builds its nest there, which is made of dried grass, tender fibres of plants, and lined with hair. It sings incessantly night and day, during the breeding time, and imitates, by turns, the notes of the sparrow, the skylark, and other birds, from which it is called the English *mock-bird*. The arduous time of incubation is now come, and birds are sedulously employed in hatching and rearing their young.

The insect tribes continue to add to their numbers; among these may be named several kinds of moths and butterflies (*papilio atalanta*, *cardamines*, *ægeria*, &c.) Spenser has the following beautiful stanzas on the *butterfly*:—

The woods, the rivers, and the meadows green,
 With his air-cutting wings he measured wide;
 Ne did he leave the mountains bare unseen,
 Nor the rank grassy fens delights untried.
 But none of these, however sweet they been,
 Mote please his fancy, nor him cause abide.
 His choiceful sense with every change doth flit;
 No common things may please a wavering wit.

To the gay gardens his unstayed desire
 Him wholly carried, to refresh his sprites,
 There lavish Nature, in her best attire,
 Pours forth sweet odours and alluring sights;
 And Art, with her contending, doth aspire
 T' excel the natural with made delights:
 And all that fair or pleasant may be found,
 In riotous excess doth there abound.

There he arriving, round about doth fly
 From bed to bed, from one to other border,
 And takes survey, with curious busy eye,
 Of every flower and herb there set in order;
 Now this, now that, he tasteth tenderly,
 Yet none of them he rudely doth disorder,
 Ne with his feet their silken leaves deface,
 But pastures on the pleasures of each place.
 And evermore, with most variety
 And change of sweetness (for all change is sweet),
 He casts his glutton sense to satisfy;
 Now, sucking of the sap of herb most meet,
 Or of the dew which yet on them does lie,
 Now in the same bathing his tender feet:
 And then he percheth on some bank thereby,
 To weather him, and his moist wings to dry.

Other insects now observed, are field crickets (*gryllus campestris*), the chaffer or may-bug (*scarabæus melolontha*), and the forest-fly (*hippobosca equina*), which so much annoys horses and cattle. The female wasp (*vespa vulgaris*) appears at the latter end of the month. For a full account of that curious fabric, a wasp's nest, see T. T. for 1815, p. 193.

About this time, *bees* send forth their early swarms. Nothing can afford greater amusement than to watch the members of this industrious community in their daily journies from flower to flower.—(See our last volume, p. 149.)

The following is a list of trees, plants, and flowers,

from which the bees extract their honey and wax: apple, arbutus, apricot, ash, almond; althea frutex, anemone, aspen, balm, blackberry, burrage, betony, box, beans, buck-wheat, broom; burnet, cabbages, cauliflowers, cherry, clover, chesnut and horse chesnut, currants, cypress, dandelion, endive, elm, elder, furze, gooseberry, golden-rod, gourds, melons, cucumbers, hawthorn, heath, hyacinths, iris, jonquill, lucerne, lavender, laurel, lily, lemon-tree, mignonette, melilot (*trifolium melilotus officinalis*), mustard, marshmallows, oak, parsley, pear-tree, parsnip (in flower), poppy, primrose, plum-trees, rosemary, radishes, raspberry, strawberry, sage, savory, saffron, sainfoin, sunflower, single roses, turnips, thyme, willow, wild marjoram, vetches, violets, and all resinous trees.

In the list of these plants and flowers, the *golden-rod* must be particularly noticed, as it begins to flower when all the other flowers have faded, and continues in bloom until the middle of November. This flower is always covered with bees during the last months of the summer, and the two first of autumn, provided the weather will permit the bees at that season of the year to leave the hive. This plant should be particularly cultivated in the vicinity of an apiary. It will grow in the worst of soils; and an acre of unarable land planted with the golden-rod, would furnish at the close of the season a sufficiency for a hundred hives to complete their winter stock.

In general, all those plants ought to be cultivated which begin to blow in February and March, and those which keep flowering to the close of the season. The bees, always active and laborious, turn to advantage with the same ardour the last as well as the first moments of vegetation, and the flowering of the plants.

All vegetables contain more or less the principles of honey, only in a greater or less degree; consequently, the bees can maintain themselves every where, and gather a stock of honey proportionate to

the abundance which is offered to them in the country which they occupy. It is, however, the rich and vast meadows well studded with flowers in which the useless daisy is not seen, the fields whitened with buck-wheat, the plains gilded with the flower of the wild mustard, the turnip, and the cabbage, and the forests of oak, ash, elm, &c., that present to the bees a daily supply of excellent food, and an abundance of provisions, wherewith to fill their magazines^{*}.

The BIRTH of the BEE.

With course unvarying, thus the mother bee
Lays in the comb her shell-bound progeny;
Four days the embryo rests in still repose,
Ere the fifth morn its brittle crust uncloses.
Coiled in a ring her pliant folds she twines,
And round her frame the clear albumen shines;
While the fond parent, with instinctive zeal,
Brings to her eager grasp the fragrant meal.

Soon as four days their destined course have run,
And sunk beneath the wave th' unwearied sun,
The full-formed nymph clings to her close-sealed tomb,
Spins her own silky shrouds, and courts the gloom.
But, while within a seeming grave she lies,
What wondrous changes in succession rise!
Those filmy folds, which cased the slimy worm,
Now thrown aside, uncoils her length'ning form;
Six radiant rings her shining shape invest,
The hoary corslet glitters on her breast;
With fearful joy she tries each salient wing,
Shoots her slim trunk, and points her pigmy sting.
Though yet of tender mould, and faintest hue,
The pale Aurelia glimmers to the view;
Soon, black'ning by degrees each hardened scale,
Fringed with light hairs, she shows her plaited mail.

When twice six suns have on bright axle rolled,
And edged the parting clouds with fleecy gold,
To fresh existence called, she proudly scorns
Her limbs imprisoned, and her blunted horns,

^{*} See Mr. Huish's Treatise on Bees, p. 371, the *last* on this subject, and containing a mass of curious information relative to the natural history and management of this interesting insect.

New to the light, as sense impulsive leads,
 She seeks at once the flow'r-enamelled meads,
 Sucks the pure essence from each honeyed bell,
 And bears within her breast the crystal well.
 Wings through the rifted wax her easy way,
 And hails, on fluttering wing, the cheerful day.

DR. EVANS'S BEES, a Poem¹.

About the commencement of the month, the flowers of the lily of the valley (*convallaria maialis*) and the flowers of the chesnut tree (*fagus castanea*) begin to open; the tulip tree (*liriodendron tulipifera*) has its leaves quite out, and the flowers of the oak (*quercus robur*), the Scotch fir (*pinus sylvestris*), the honey-suckle, and the beech, are in full bloom. Towards the middle, the flowers of the white thorn are quite out, and the mulberry tree (*morus nigra*) puts forth its leaves; the walnut (*juglans regia*) has its flowers in full bloom; the flowers of the garden rose also begin to open.

Look, Delia, how w' esteem the half-blown rose,
 The image of thy blush and summer's honour;
 Whilst yet her tender bud doth undisclose
 That full of beauty Time bestows upon her.

¹ The WOUNDED CUPID.

CUPID, as he lay among
 Roses, by a bee was stung.
 Whereupon, in anger flying
 To his mother, said thus, crying,
 Help, O help, your boy's a dying!
 And why, my pretty lad? said she.
 Then, blubbering, replied he,
 A winged snake has bitten me,
 Which country people call a bee.
 At which she smiled; then with her hairs
 And kisses drying up his tears,
 Alas, said she, my wag! if this
 Such a pernicious torment is;
 Come tell me then, how great's the smart
 Of those thou woundest with thy dart?

HERRICK.

No sooner spreads her glory in the air,
 But straight her wide-blown pomp comes to deckne;
 She then is scorned that late adorned the fair;
 So fade the roses of those cheeks of thine.
 No April can revive thy withered flowers,
 Whose springing grace adorns thy glory now;
 Swift speedy Time, feathered with flying hours,
 Dissolves the beauty of the fairest brow:
 Then do not thou such treasure waste in vain,
 But love now while thou may'st be loved again.

DANIEL.

The lilac (*syringa vulgaris*), the barberry (*berberis vulgaris*), and the maple (*acer campestre*), are now in flower. At the latter end of the month, rye (*secale hybernium*) is in ear; the mountain ash (*sorbus aucuparia*), laburnum (*cytiscus laburnum*), the guelder rose (*viburnum opulus*), clover (*trifolium pratense*), columbines (*aquilegia vulgaris*), the alder (*rhamnus frangula*), the wild chervil (*chaerophyllum temulum*), and the wayfaring tree, or guelder-rose, have their flowers full blown.

The germander (*veronica chamaedrys*) is seen in hedges, and various species of meadow grass are now in flower. Heart's-ease (*viola tricolor*) shows its interesting little flower in corn fields. In allusion to this last flower, observes Mr. Leigh Hunt², it is pleasant to light upon an universal favourite whose merits answer one's expectation. We know little or nothing of the common flowers among the ancients; but as violets in general have their due mention among the poets that have come down to us, it is to be concluded that the heart's-ease could not miss its particular admiration,—if indeed it existed among them in its perfection. The modern Latin name for it is *flos Jovis*, or Jove's flower,—an appellation rather too worshipful for its little sparkling delicacy, and more suitable to the greatness of an hydrangia, or to the diadems of a rhododendron.

² Feast of the Poets, Notes, p. 113.

With all the beauties in the vallies bred,
 Wild mint, that's born with myrtle crowns to wed,
 And Jove's own flow'r, that shares the violet's pride,
 Its want of scent with triple charm supplied.

RAPIN ON GARDENS.

The name given it by the Italians is *flammola*, the little flame;—at least, this is an appellation with which I have met, and it is quite in the taste of that ardent people. The French are perfectly *aimable* with theirs:—they call it *pensée*, a thought, from which comes our word pansy:—

‘There’s rosemary,’ says poor Ophelia; ‘that’s for remembrance;—pray you, love, remember; and there is pansies,—that’s for thoughts.’ Drayton, in his world of luxuries, the Muse’s Elysium, where he fairly stifles you with sweets, has given, under this name of it, a very brilliant image of its effect in a wreath of flowers:—the nymph says,

Her damask roses, white and red,
 Out of my lap first take I,
 Which still shall run along the thread;
 My chiefest flow’r this make I.
 Amongst these roses in a row,
 Next place I pinks in plenty,
 These double-daisies then for show;
 And will not this be dainty?
 The pretty pansy then I’ll tie,
Like stones some chain enchasing;
 The next to them, their near ally,
 The purple violet placing.

NYMPHAL 5th.

Milton, in his fine way, gives us a picture in a word,—‘The pansy *freaked* with jet.’ Another of its names is *love-in-idleness*, under which it has been again celebrated by Shakspeare, in the ‘Midsummer Night’s Dream.’ Oberon says to Puck:—

Yet marked I where the bolt of Cupid fell:—
 It fell upon a little western flower,—
 Before, milk-white,—now purple with love’s wound,—

And maidens call it *Love-in-idleness*.
 Fetch me that flow'r,—the herb I showed thee late:
 The juice of it, on sleeping eyelids laid,
 Will make or man or woman madly dote
 Upon the next live creature that it sees.

The butter-cup (*ranunculus bulbosus*) spreads over the meadows; the cole-seed (*brassica napus*) in corn-fields, bryony (*brionia dioica*), and the arum, or cuckoo-pint, in hedges, now show their flowers.

The female glow-worm (*lampyrus noctiluca*) is seen on dry banks, about woods, pastures, and hedge-ways, exhibiting, as soon as the dusk of the evening commences, the most vivid and beautiful phosphoric splendour, in form of a round spot of considerable size.

The *marine* plants which flower this month, and which are chiefly found on sea-shores and in the crevices of rocks, are, buck's horn (*plantago cornopos*), which flowers the whole summer; burnet saxifrage (*pimpinella dioica*), sea arrow-grass (*triglochin maritimum*) on muddy shores; the clammy lychnis (*lychnis viscaria*); the cerastium tetrandrum; scurvygrass (*cochlearia*), sea-kale (*crambe maritima*) on sandy shores; the sea-cabbage (*brassica oleracea*), the sea stork's bill (*erodanum maritimum*), the slender bird's foot trefoil (*lotus diffusus*), the mountain flea-wort (*cineraria integrifolia*) on chalky cliffs; and the sedge (*carex arenaria*) on sea-shores.

When we survey the *plants of the sea*, how discernible is that Wisdom which hath provided for their subsistence and safety in that element! Such as have broad leaves, and would be forced from their station by tides or storms, if their roots were fixed into an earthy bottom, are fastened by the root to weighty stones and pebbles; where, instead of being driven about at random by the agitations of the water, they lie safe at anchor. That they may not be bruised by lying prostrate on the ground, they are rendered pow-

erfully buoyant, and kept in an erect position, by means of large vesicles of air, variously disposed about their leaves or their stalks, as the difference of their form and structure may require. A similar provision for their preservation is observable in many of the plants which grow upon the land. Such as are tender and flexible, and apt to trail upon the ground, are furnished with spiral tendrils, or other like means, by which they lay hold of other plants that are firm and upright.

The leafing of trees, which is, usually, completed in May, takes place in the following order: (1) The willow, poplar, alder, and other aquatics; (2) The lime, sycamore, and horse-chesnut; (3) The oak, beech, ash, walnut, and mulberry; but the whole of the third number are not in full leaf till next month. Mr. Stillingfleet, in his Tracts (p. 142), gives the following as the order of the leafing of trees and shrubs, as observed by him, in Norfolk: *January* 15, honey-suckle. *March* 11, gooseberry, currant, elder. *April* 1, birch, weeping-willow; 3, raspberry, brambles; 4, briar; 6, plum, apricot, peach; 7, filbert, sallow, alder; 9, sycamore; 10, elm, quince; 11, marsh elder; 12, wych elm; 13, quicken tree, hornbeam; 14, apple tree; 16, beech, chesnut; 17, willow; 18, oak, lime; 19, maple; 21, walnut, plane, black poplar, beech, acacia, robinia; 22, ash, carolina poplar.

Not small the praise the skilful planter claims
From his befriended country. Various arts
Barrow from him materials. The soft beech,
And close-grained box, employ the turner's wheel,
And with a thousand implements supply
Mechanic skill. Their beauteous veins the yew
And *phylarea* lend, to surface o'er
The cabinet. Smooth *linden* best obeys
The carver's chisel; best his curious work
Displays in all its nicest touches. *Birch*—
Ah! why should birch supply the chair? since oft
Its cruel twigs compel the smarting youth
To dread the hateful seat? Tough-bending *ash*

Gives to the humble swain his useful plough,
 And for the peer his prouder chariot builds.
 To weave our baskets the soft *osier* lends
 His pliant twigs: Staves that nor shrink nor swell,
 The cooper's close-wrought cask to *chestnut* owes.
 The sweet-leaved *walnut*'s undulated grain,
 Polished with care, adds to the workman's art
 Its varying beauties. The tall, tow'ring *elm*,
 Scooped into hollow tubes, in secret streams
 Conveys for many a mile the limpid wave;
 Or from its height, when humbled to the ground,
 Conveys the pride of mortal man to dust.
 And last the OAK, king of Britannia's woods,
 And guardian of her isle! whose sons robust,
 The best supporters of incumbent weight,
 Their beams and pillars to the builder give;
 Of strength immense: or in the bounding deep
 The loose foundations lay of floating walls,
 Impregably secure.

DODSLEY.

In reference to an observation made in our last volume (p. 244), respecting the plantation and growth of the oak, it is, we think, but justice to His Majesty's *Commissioners of Woods and Forests*, to state, that we have had the satisfaction of perusing their last '*Triennial Report*,' and we willingly bear testimony to their meritorious and unceasing labours in performing the important duties entrusted to their care. The inclosure of the different forests; the various nurseries established for oak plants; the measures adopted generally for the growth of navy timber; the numerous experiments instituted to ascertain its durability; their patient investigation, and beneficial results; are equally creditable to the science and industry of the Commissioners. They have not 'let pass'

The fair occasion to remotest time
 Their name with praise, with honour to transmit!
 So shall their country's *rising fleets* to THEM
 Owe future triumphs;—so her *naval strength*,
 Supported from within, shall fix her claim
 To ocean's sovereignty; and to her ports
 In every climate of the peopled earth

Bear commerce; fearless, unresisted, safe.
Let then the great ambition fire your breast,
For this your *native land*; replace the lost
Inhabitants of her deserted plains.
Let Thame once more on *Windsor's* lofty hills
Survey young forests *planted by your hands*.
Let fair Sabrina's flood again behold
The Spaniard's ¹ terror rise renewed. And Trent,
From *Sherwood's* ample plains with pride convey
The bulwarks of her country to the main.

In this month, the grass is commonly grown so as to afford a good bite for sheep and cows. In parishes which are not inclosed, or, though inclosed, where there is a *common*, the herd generally go upon it on *Old May Day*, and continue till Old Michaelmas. The herd in a parish of a moderate size will consist, perhaps, of a hundred. The office of *herdsman*, like most offices of *emolument*, is often in great request, and much interest is made to obtain it. He has about six shillings a head for the season, and has one boy to assist him, found by the parish; but, if he wants another, he has to find him himself. The herd goes out between four and five o'clock in the morning, when the herdsman blows his horn, as he passes along the street, as a signal for the cows to be turned out of the yards. They return between six and seven, when the horn again sounds as a signal for the farmyard gates to be opened to admit 'the balmy-breathing kine.' There is generally much confusion among the herd, for the first two or three days, till they have determined their respective strength and precedence. One particular cow usually becomes the leader of the whole herd.

The juices of the young springing grass contribute

¹ The officers on board the Spanish fleet, in 1588, called the Invincible Armada, had it in their orders, if they could not subdue the island, at least to destroy the Forest of Dean, which is in the neighbourhood of the river Severn.

to render the milk of the cows more abundant, and of a finer quality; furnishing employment for the dairy.

Slow rolls the churn, its load of clogging cream
At once foregoes its quality and name;
From knotty particles first floating wide,
Congealing butter's dashed from side to side;
Streams of new milk through flowing coolers stray,
And snow-white curd abounds and wholesome whey.

This is the season in which cheese is made; the counties most celebrated for this article are Cheshire, Wiltshire, and Gloucestershire.

The corn is benefited by a cold and windy May, as it is too apt to run into stalk, if the progress of vegetation be much accelerated by warm weather at this season. In late years, some sowing remains to be done; and in forward ones, the weeds should be well kept under.

We cannot better conclude the natural history of the 'pleasant month of May' than with the beautiful *Elegy of the 'GOLDFINCHES,'* by the author of the charming poem of the '*Swallows,*' given at the end of last month's Diary.

To you, whose groves protect the feathered choirs,
Who lend their artless notes a willing ear,
To you, whom pity moves and taste inspires,
The doric strain belongs, O Shenstone! hear.

'Twas gentle Spring, when all the plummy race,
By Nature taught in nuptial leagues combine,
A Goldfinch joyed to meet the warm embrace,
And with her mate in Love's delights to join,

All in a garden, on a currant-bush,
With wondrous art they built their airy seat;
In the next orchard lived a friendly Thrush,
Nor distant far a Woodlark's soft retreat.

Here blessed with ease, and in each other blessed,
With early songs they waked the neighbouring groves,
Till time matured their joys, and crowned their nest
With infant pledges of their faithful loves.

And now what transport glowed in either's eye !
What equal fondness dealt th' allotted food !
What joy each other's likeness to descry,
And future sonnets in the chirping brood !

But, ah ! what earthly happiness can last ?
How does the fairest purpose often fail ?
A truant school-boy's wantonness could blast
Their flattering hopes, and leave them both to wail.

The most ungente of his tribe was he,
No generous precept ever touched his heart ;
With concord false and hideous prosody
He scrawled his task, and blundered o'er his part.

On mischief bent, he marked, with ravenous eyes,
Where wrapt in down the callow songsters lay,
Then rushing, rudely seized the glittering prize,
And bore it in his impious hands away !

But how shall I describe, in numbers rude,
The pangs for poor Chrysomitris decreed,
When from her secret stand aghast she viewed
The cruel spoiler perpetrate the deed ?

' O grief of griefs ! (with shrieking voice she cried)
What sight is this, that I have lived to see ?
O ! that I had in Youth's fair season died, *
From Love's false joys and bitter sorrows free.

' Was it for this, alas ! with weary bill,
Was it for this, I poised th' unwieldy straw ?
For this I bore the moss from yonder hill,
Nor shunned the pond'rous stick along to draw ?

' Was it for this I picked the wool with care,
Intent with nicer skill our work to crown ?
For this, with pain, I bent the stubborn hair,
And lined our cradle with the thistle's down ?

' Was it for this my freedom I resigned,
And ceased to rove at large from plain to plain ?
For this I sate at home whole days confined,
To bear the scorching heat and pealing rain ?

' Was it for this my watchful eyes grow dim ?
For this the roses on my cheek turn pale ?
Pale is my golden plumage, once so trim ;
And all my wonted mirth and spirits fail.

' O Plunderer vile ! O more than adders fell !
 More murderous than the cat, with prudish face ;
 Fiercer than kites in whom the furies dwell,
 And thievish as the cuckoo's pilfering race.

' May juicy plums for thee forbear to grow,
 For thee no flower unveil its charming dies ;
 May birch-trees thrive to work thee sharper woe,
 And listening starlings mock thy frantic cries !

Thus sang the mournful bird her piteous tale,
 The piteous tale her mournful mate returned ;
 Then side by side they sought the distant vale,
 And there in secret sadness inly mourned.

JAGO.

JUNE.

THE Saxons called June *weyd-monat*, because their beasts did then *weyd* or feed in the meadows.

Remarkable Days.

1.—TRINITY SUNDAY.

STEPHEN, Bishop of Liege, first drew up an office in commemoration of the Holy Trinity, about the year 920 ; but the festival was not formally admitted into the Romish church till the fourteenth century, under the *pontificate* of John XXII.

1.—NICOMEDE.

Nicomede was beaten to death with leaden plummets, on account of his religion, in the reign of Domitian.

*2. 1780.—RIOTS IN LONDON BEGAN.

4. 1738.—KING GEORGE III BORN.

5.—SAINT BONIFACE.

Boniface was created Bishop of Mentz in the year

145: He was one of the first priests of his day, and was also a great friend and admirer of the Venerable Bede. He was murdered in a barbarous manner by the populace near Utrecht, while preaching the Christian religion.

5.—CORPUS CHRISTI.

This festival, 'the body of Christ,' was appointed in honour of the Eucharist, and always falls on the Thursday after Trinity Sunday. This day, termed the *Fête Dieu*, is one of the greatest festivals of the Romish church, beginning on Trinity Sunday, and ending on the Sunday following.—See T.T. for 1815, pp. 172, 173, for an account of some most strange and ridiculous ceremonies, formerly observed, on this and St. John's-day.

11.—SAINT BARNABAS.

Our saint's proper name was *Joses*; he was descended of the tribe of Levi, and born at Cyprus. Being shut up all night in the synagogue by some Jews, at Salamis, he was, the next morning, cruelly tortured, and afterwards stoned to death. The *Epistle* which he wrote is considered genuine, though not admitted into the canon of the church..

*14. 1800.—BATTLE OF MARENGO.

About two miles from Alessandria (observes a recent traveller*) is the village of Marengo, surrounded by that plain rendered so celebrated all over the world, for the bloody battle fought there by Bonaparte in person, on this day, between the French and Austrians. This victory decided the fate of Piedmont and Lombardy; but it cost the life of the intrepid Dessaix, of many other excellent officers, and of full 15,000 men, killed, wounded, and prisoners on both sides. A column is placed near the spot where Dessaix fell, with an inscription in Italian,

* Mr. Coxe, in his *Picture of Italy*, p. 75.

Latin, and French : a few skulls collected in digging the foundation, and ranged in order round the pedestal, form a savage, but appropriate, ornament to this monument. The plain of Marengo, entirely destitute of wood, and indeed of vegetation, presents one naked, barren extent of land ;—a fit place for the demon of war to practise his horrid rites, and immolate his victims.

17.—SAINT ALBAN.

St. Alban, the first Christian martyr in this island, suffered in the year 303.

*18. 1815.—BATTLE OF WATERLOO.

How sleep the BRAVE, who sink to rest,
By all their country's wishes blest !
When Spring, with dewy fingers cold,
Returns to deck their hallowed mould,
She there shall dress a sweeter sod
Than Fancy's feet have ever trod.

By fairy hands their knell is rung,
By forms unseen their dirge is sung ;
Their HONOUR comes, a pilgrim grey,
To bless the turf that wraps their clay,
And FREEDOM shall awhile repair,
To dwell a weeping hermit there !

*18. 1765.—OTAHEITE DISCOVERED.

20.—TRANSLATION OF EDWARD, *King of the West Saxons*.

Edward, being barbarously murdered by his mother-in-law, was first buried at Warham, without any solemnity ; but, after three years, was carried by Duke Alferus to the minster of Shrewsbury, and there interred with great pomp.

21.—LONGEST DAY.

This day is, in London, 16 h. 34 m. 5 s., allowing 9 m. 16 s. for refraction.

*22. 1483.—RICHARD III BEGAN TO REIGN.

Those historians who favour Richard, for even

he has met partizans among later writers, maintain that he was well qualified for government, had he legally obtained it; and that he committed no crimes but such as were necessary to procure him possession of the crown; but this is a very poor apology, when it is confessed that he was ready to commit the most horrid crimes which appeared necessary for that purpose; and it is certain that all his courage and capacity, qualities in which he really seems not to have been deficient, would never have made compensation to the people for the danger of the precedent, and for the contagious example of vice and murder, exalted upon the throne. This prince was of small stature, hump-backed, and had a very harsh disagreeable visage; so that his body was in every particular no less deformed than his mind.—*Hume.*

***23. 1770.—DR. AKENSIDE DIED.**

On a SERMON against GLORY.

Come then, tell me, sage divine,
Is it an offence to own
That our bosoms e'er incline
Toward immortal glory's throne?
For with me nor pomp, nor pleasure,
Bourbon's might, Braganza's treasure,
So can fancy's dream rejoice,
So conciliate reason's choice,
As one approving word of her impartial voice.

If to spurn at noble praise
Be the passport to thy heaven,
Follow thou those gloomy ways;
No such law to me was given,
Nor, I trust, shall I deplore me,
Faring like my friends before me;
Nor an holier place desire
Than Timoleon's arms acquire,
And Tully's curule chair, and Milton's golden lyre.

24.—SAINT JOHN THE BAPTIST, AND MIDSUMMER DAY.

The nativity of Saint John the Baptist is celebrated by the Christian church on this day, because he was

the *Forerunner* of our blessed Lord, and, by preaching the doctrine of repentance, prepared the way for the Gospel. He was imprisoned by Herod for preaching against his marriage with his brother's wife, and was afterwards beheaded by the arts of that enraged woman.

It was formerly customary at Magdalen College, Oxford, on St. John the Baptist's day, to have a sermon preached in the first court. There is a permanent pulpit of stone inserted in one corner, and the quadrangle used to be furnished round the sides with a large fence of green boughs, that the preaching might more nearly resemble that of John the Baptist in the wilderness. But, of late years, as we grow more tender than our forefathers, it has been thought safer to take shelter under the roof of the chapel. (See Jones's *Life of Bp. Horne*, p. 117.) It is to this institution that we owe the bishop's admirable 'Considerations on the Life and Death of John the Baptist.'

O'er Jordan's wave and wild Bethabara's plain,
Where rocks on rocks in clouded grandeur reign;
Dark shaded forests spread their empire wide
And whitened torrents lave the mountain's side;
The Prophet *John* retired from mortal sight,
To bask at large in heaven's refulgent light:
Around his loins a leathern belt he wore,
Of camel's hair a shaggy vestment bore.
Amid the foliaged gloom he passed his time,
And o'er the mountain crag essayed to climb:
No silken couch or storied roof he found,
A stone his pillow, and his bed the ground:
No note harmonious swelled the desert blast,
No costly changes lengthened his repast:
The God of *Abraham* tuned his mental ear;
The God of *Isaac* sent his locusts near;
The God of *Jacob* calmed the angry mind,
And the mild honey taught him where to find;
Poured on his soul the ray prophetic given,
To point to Man the dawning path to heaven.

COTTELL.

Several superstitious observances were formerly practised on Midsummer-eve, of which some account will be found in our former volumes.

The village maids mysterious tales relate
Of bright *midsummer's* sleepless nights; the fern
That time sheds secret seeds; and they prepare
Untold of rites, predictive of their fate:
Virgins in silent expectation watch
Exact at twelve's propitious hour, to view
The future lover o'er the threshold pass;
Th' inviting door wide spread, and every charm
Performed, while fond hope flutters in the breast,
And credulous fancy, painting his known form,
Kindles concordant to their ardent wish.

BIDLAKE.

*27. 1777.—DR. DODD EXECUTED.

Dodd's was a life of thoughtlessness and extravagance, and he paid dearly for all his faults in the conclusion of it. Courage at an earlier period, to have met the evils he brought upon himself, might have saved him from the last and most terrible one. Had he lived an economist, he might have died honourably. Yet, let him have his due; and his claim is not small—Many were reclaimed from vice, and many relieved from wretchedness, by his labours. Who derived advantage from his death? When one reads his pathetic appeals for mercy, at his trial, and in the Prison Thoughts, one is tempted to ask *if the hearts to which they were made were HUMAN, or ever knew what it was to err?* But it was an appeal to AVARICE under the name of JUSTICE; and at a tribunal, where *property* is of more value than the *life of man*, such an appeal is not likely to be heard. The advertisement prefixed to the MS. of the Prison Thoughts, concludes with a remarkable break, more impressive than the most finished rhetoric:—‘The thinking will easily pardon all inaccuracies, as I am neither able nor willing to read over these melancholy lines with a *curious* and *critical* eye. They are imperfect, but the language of the heart; and, had I

time and inclination, might and should be improved. But ———.

29.—SAINT PETER.

This apostle's father was Jonah, probably a fisherman of Bethsaida. Peter was first scourged, and then led out to be crucified upon the hill called *Janiculus*, desiring to be fastened to the cross with his head downwards, alleging that he thought himself unworthy to die in the same way as his Lord and Master.

Astronomical Occurrences

In JUNE 1817.

THE Sun enters Cancer at 30 m. past 8 in the evening of the 21st; he also rises and sets at the times specified in the following table for every fifth day :

TABLE.

Sunday, June 1st,	Sun rises 53 m. after 3.	Sets 7 m. after 8
Friday, . . . 6th,	. . . 49 . . . 3	. . . 11 . . . 8
Wednesday, 11th,	. . . 46 . . . 3	. . . 14 . . . 8
Monday, . . . 16th,	. . . 44 . . . 3	. . . 16 . . . 8
Saturday, . . . 21st,	. . . 43 . . . 3	. . . 17 . . . 8
Thursday, . . . 26th,	. . . 44 . . . 3	. . . 16 . . . 8

When it is required to find mean or true time from apparent time, as shown by a correct sun-dial, use the correction as indicated in the subsequent Table, which answers for every fifth day of the present month.

TABLE.

		m.	s.
June 1st,	from the time on the dial subtract	2	37
6th,	. . . . .	1	49
11th,	. . . . .	0	52
16th,	to the time on the dial add	0	10
21st,	. . . . .	1	15
26th,	. . . . .	2	19

¹ See Mr. Southey's *Specimens of the later English Poets*, vol. iii, p, 133.

The Moon will enter her last quarter at 37 m. past 5 in the evening of the 6th of this month. There will be a new Moon at 45 m. after 9 in the evening of the 14th; her first quarter will commence 4 m. after 7 on the morning of the 22d; and she will be full at 18 m. past 11 at night on the 28th. The Moon will also be on the first meridian at convenient times for observation on the following days, viz.

June 3d,	at 26 m. after 3	in the morning
25th, . 1 . . .	9	in the evening
26th, . 59 . . .	9	
27th, . 0 . . .	11	
28th, . 3	after midnight.	

Venus will appear stationary on the 12th, Saturn on the 16th, and Mercury on the 23d of the present month. Mercury will also be in his inferior conjunction at 3 in the morning of the 12th, and the Georgium Sidus will be in opposition at 9 in the evening of the 4th.

The satellites of Jupiter will be visibly eclipsed on the following days, and the *emersions* will take place as below :—

1st Satellite . 3d,	at 22 m. past 1	morning
. 11th,	. 45 . . .	9 evening
. 18th,	. 40 . . .	11 . . .
2d Satellite . 12th,	. 4 . . .	11 . . .

These eclipses are calculated for mean time at the first meridian, and it is to the Royal Observatory and its vicinity that the word *visible* refers.

On the Orbits, Motions, Magnitudes, and Distances, of the Earth and Moon.

WE have already given a popular view of the eclipses of the Sun and Moon (see T. T. vol. i, p. 181, and vol. ii, p. 79) and indicated our intention to explain the method by which they are calculated; but, as they depend upon the relative situations of the Earth and the Moon with respect to the Sun and to each other, their distances, magnitudes, velocities, and parallaxes, previously to our entering upon that explanation, it

will be useful for the student to attend to the following observations ; as by that means he will more readily understand the principles and terms that must be used in elucidating the subject.

Observation and analogy have now converted many propositions that were once doubtful, into established facts ; such are the motions of the Earth and Moon. To common observation, both the Sun and the Moon appear to perform their revolutions about the Earth as a centre ; but the science of Astronomy proves that this is true of the Moon only, while both that body and the Earth are carried together about the Sun. And as it is the different positions of these two bodies in their orbits with respect to each other and the great central luminary which give rise to the phenomena of eclipses, and their relative motions and distances from each other that regulate their duration, we shall endeavour to give as brief an explanation as possible of the principal circumstances of the motions, magnitude, and distances of each : and first of

THE EARTH.

Before men were enlightened by science, they confounded realities with appearances ; and, being able to see only a small portion of the Earth's surface at one time, they regarded the world they inhabited as an extended plain, placed in the middle of the universe ; and about which the Sun, Moon, and stars, performed their diurnal revolutions. It is now, however, known that this is not the case, but that the Earth is nearly a spherical body, the mean radius of which is about 3956 English miles.

Astronomy not only furnishes the means of ascertaining the shape and magnitude of the Earth, as well as of the other bodies belonging to the solar system, but it also supplies the means of ascertaining its place in that system, and of calculating its motion. We have already explained one method by which astronomers determine the distance between the Earth and

the Sun, in our article on finding the parallax. See last month's *Occurrences*. This, however, is not the only one which is employed for that purpose. When the parallax of the Sun, or the angle that the semidiameter of the Earth would subtend to a spectator at the Sun, is known, the distance between these bodies may readily be found, as it forms one side of a right angled triangle, of which the parallax is one of the acute angles, and the radius of the Earth its opposite side. If, therefore, the horizontal parallax be denoted by p , the radius of the Earth by r , and the required distance by D , we shall have

$$\text{Rad. } 1 : D :: \sin p : r;$$

and consequently

$$D = \frac{r}{\sin p}.$$

Now it has been stated, that the mean horizontal parallax is about $8''.78$, and by substituting this for p in the preceding formula, we shall obtain 23524 terrestrial semidiameters for the mean distance of the Earth from the Sun; which, multiplied by 3956, gives a little more than 93 millions of English miles.

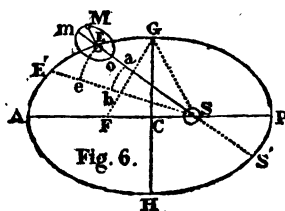
The apparent diameter of a heavenly body is the number of degrees, minutes, &c. under which it appears to an observer; and this is ascertained by observation, and by means of the micrometer. It is found, that the apparent diameter of the Sun, as seen from the Earth, is $1922''.7$, or about $32'$. The parallax of the Sun and his apparent diameter being known, it is easy to determine the magnitude of that luminary; for since the parallax is the angle at the Sun subtended by the radius of the Earth, and the apparent radius of the Sun is about $16'$ or $960''$, we have

$$8''.78 : 960'' :: \text{the terr. rad.} : \text{the solar rad.}$$

$$\text{and which is, therefore, } = \frac{960}{8.78} = 109.34 \text{ nearly.}$$

Hence the solar diameter is more than one hundred and nine times that of the Earth.

A series of continued observations on the Sun soon produced the conviction, that, besides his apparent diurnal motion, he did not return precisely to the same point in the heavens each succeeding day; but that he appeared to traverse the whole twelve signs, and consequently to make the tour of the whole ecliptic, in the space of a year. Now as this apparent motion may be produced either by the real motion of the Sun or by that of the Earth in an opposite direction, and both reason and analogy decide for the latter, astronomers regard the Earth as revolving about the Sun once in $365\frac{1}{4}$ days very nearly. This will be evident from an inspection of the following figure, in which if S represent the Sun, and E the Earth, it is obvious that when the latter is at E, the former will appear to be at S'; and that while the Earth moves from E to A, the Sun will appear to move through the opposite part of the orbit S'P, and, in the contrary direction, from S' to P.



If, therefore, an observer were situated at the surface of the Sun, he would perceive that the Earth had two distinct motions; the one about its axis in the space of every 24 hours, and the other about the Sun in a year. This annual motion, however, is not performed in a circle, but in an ellipse having the Sun in one of its foci; for the Sun's apparent diameter experiences periodic variations, and shows that his distance from the Earth also varies with the position of this latter body.

The point P (fig. 6), where the Earth is nearest the

Sun, and where the apparent diameter of that body is the greatest, is called the *perigee*; it is diametrically opposite the point A, which is the greatest distance, and is called *apogee*; the former is also sometimes called the *perihelion*, and the latter the *aphelion*: both these points together are denominated the *apsides*, and the line (AP in the preceding figure) which joins them the *line of apsides*. The Earth is in the first of these points near the winter solstice, and it arrives at the other near the summer solstice, and is then at its greatest distance from that vivifying luminary.

When the Earth is in apogee, the apparent solar diameter is $31'.516$; and, when in perigee, $32'.593$: though the difference is not very great, it shows that the ecliptic, through which the Earth travels in its annual course round the Sun, is an oval (as represented in the preceding figure, by the elliptic curve AGPH), in which the two lines AS and SP are the greatest and least distances; and as they are to each other in the same ratio as the apparent diameters of the Sun,

$$AS : SP :: 32'.593 : 31'.516.$$

From this proportion it appears that the greatest distance exceeds the least by about a 30th part of itself.

The distance of the Sun from the Earth may now be stated to be, when he is

In perigee	. 23075 terrestrial rad.
In apogee	. 23973
Mean distance	23524

The greatest dimension AP of the entire orbit is therefore equal to 47048 of the Earth's semidiameters.

Supposing the Earth always to have the same velocity in its orbit, it would describe equal portions of it in equal times: but as the line SE, which passes through the centres of the Earth and Sun,

and is denominated the *Radius Vector*, is subject to variation, if there be taken on the orbit two equal arcs supposed to be described in equal times, these two arcs, as seen from the Sun, will appear to be unequal; that will appear to be the greatest which is at the least distance. This actually happens; and the angular space which the Sun describes, decreases at the same time that the apparent diameter diminishes; that is, when the distance augments. And, by comparing the decrease of the radius vector with the augmentation of these angles, it will easily be seen that these last are greater than they ought to be, from the variation of distance alone.

The apparent diameter of the Sun, in perigee, is 32'.593, and the arc which is apparently described in 24 hours is 61'.165; while in apogee, the diameter is 31'.516, and the apparent arc described in the same time is 57'.192. Hence a spectator, placed at the Sun, would see the terraqueous globe describe an arc of about 61' in perigee, and only about 57' in its apogee, but with a motion in an opposite direction to the apparent motion of the Sun. If the inverse ratio of the distances, or that of the apparent diameters, was equal to that of the arcs described, or $\frac{61.165}{57.192}$

was equal to $\frac{32.593}{31.516}$, and this took place throughout

the whole extent of the Earth's orbit; then it might be concluded that the motion of the Earth was uniform, and that inequality of distance alone caused the apparent change of velocity. But since these two fractions are not equal to each other, it must be admitted that the variation in the Earth's motion is real, and that it is accelerated when it approaches the Sun, and retarded when it recedes from it. The Earth, therefore, moves with the greatest velocity in perigee, and the least in apogee.

But the first of these fractions is equal to the

square of the second, and, consequently, equal also to the square of the inverse ratio of the distances: therefore, *if the square of the radius vector be multiplied by the angle which it describes in a given time (as 24 hours for instance); the product will always be the same quantity.* Now, as the most accurate observations verify this property for all positions of the Earth in its orbit, it ought to be admitted as one of the laws of its annual movement. Therefore, if from S there be two radii vectores SE and SE' drawn to the extremities E and E' of the arc described by the Earth in given small time, the product of the radius SE and ab , which measures the angle S , is the same throughout the whole extent of the orbit; but care should be taken to have the radius of the arc ab the same for all the angles described. The arc EE' of the ecliptic, which the Earth describes in the same time, is seen from the Sun under the angle ESE' .

But it must be remarked, that this supposes the points E and E' are so near each other that the arc EE' of the orbit may be equal in length to the circular arc Ee , described about the centre S ; so that the radii SE and SE' may be considered as equal to each other. Now it is evident that the times may easily be taken so short that this condition may be sensibly fulfilled, and, particularly, as the curve differs so little from the arc of a circle whose centre is S ; for the greatest axis exceeds the least only by about $\frac{1}{30}$ th, and this happens only in two points, the perigee and apogee. The unit of time may therefore be taken as small as we please, as, an hour, a minute, &c.; and then the above product becomes constant, and the circular sector SEe will be equal to that of SEE' of the orbit. From this property, the two following consequences may be derived:

1st. Since the area of the circular sector SEe is always proportional to the product of the square of

the radius SE and the arc ab , it follows that the *radius vector* describes equal areas in equal times : for, in the preceding figure, we have

$$Sa : SE :: ab : Ee = \frac{SE \cdot ab}{Sa}$$

and hence the area of the sector SEE' , which is equal

$$\frac{1}{2} SE \times Ee = \frac{ab \cdot SE^2}{2Sa}; \text{ and } Sa \text{ being the same}$$

quantity for the whole of the orbit, the area of the sector SEE' is proportional to $ab \cdot SE^2$, which is a constant quantity. In proportion as the radius SE increases, the angle S diminishes, and the area of SEE' remains the same. Therefore, the area described by the radius vector in a double time is double, and triple in a triple time, &c. Hence, in general, *the areas described by the radius vector are proportional to the times employed in their description.*

2d. As the products of the squares of two radii vectores, by the angle each describes in the same time, are equal, by changing this equation into a proportion, we conclude that the squares of the radii vectores are inversely proportional to the arcs they describe in very small equal times : for, let r and r' be these two radii, and a , a' , the arcs thus described ; then

$$r^2 a = r'^2 a',$$

and, by converting this equation into a proportion, we have

$$r^2 : r'^2 :: a' : a.$$

Now, in apogee, the angle described in 24 hours is $57'.192$; we may, therefore, from this proportion, find the length of the mean radius vector, between those corresponding to the apogee and perigee, when the angle it describes in a small given time is known ; or the arc when the time is given. For the square

of the mean distance is to the square of that in apogee, as 57'.192 is to the angle described by the mean radius ; or,

$$23524^2 : 23973^2 :: 57'.192 : 59' ;$$

which is the angle required, or that answering to the mean distance.

Hence, the distance of the Earth from the Sun may be found without recurring to either his parallax or his apparent diameter, by making use of the angles he describes, and these observation gives daily with great accuracy.

From what precedes we may also derive the following proportion, viz. *Any radius vector is to the mean distance as the square root of 57'.192 (or 7'.6895) is to the square root of the angle described by the first radius.*

But, in order to simplify the calculation, it is convenient to take the mean distance equal to unity; and then the different distances will be expressed in terms of this mean distance ; and, consequently, to find the terrestrial radii contained in any of these distances, it must be multiplied by 23524, the number of radii in the mean distance. The proportion will then become,

Any radius vector is to 1, as 7'.6895 is to the square root of the angle described by the first radius. Hence, when all is known but the first term, that is readily obtained for any particular part of the annual orbit.

[To be concluded next month.]

The Naturalist's Diary.

Copious dispenser of delight, bright JUNE,
All hail ! the meadows smile with flowery pride,
Shed from thy lavish hand.

THE innumerable beautiful herbs and flowers which, at this season of the year, meet our eye in every direction, appear designed only to ornament our earth,

or to gratify our sense of smelling; but, upon a more intimate acquaintance with their peculiar properties and operations, we find, that, while they contribute to embellish our gardens, they also promote the purification and renovation of the atmosphere, which becomes contaminated from various causes.

Herbs and flowers may be regarded by some persons as objects of inferior consideration in philosophy; but every thing must be great which hath God for its author. To him all the parts of nature are equally related. The flowers of the earth can raise our thoughts up to the Creator of the world as effectually as the stars of heaven; and till we make this use of both, we cannot be said to think properly of either. The contemplation of nature should always be seasoned with a mixture of devotion; the highest faculty of the human mind; by which alone contemplation is improved, and dignified, and directed to its proper object.

The first thing that engages the curiosity of man, and tempts him to bestow so much of his labour and attention upon this part of the creation, is the beautiful form and splendid attire of plants. They who practise this labour know how delightful it is. It seems to restore man in his fallen state to a participation of that felicity, which he enjoyed while innocent in Paradise.

When we cast our eyes upon this part of nature, it is first observable that herbs and trees compose a scene so agreeable to the sight, because they are invested with that green colour, which, being exactly in the middle of the spectrum of the coloured rays of light, is tempered to a mildness which the eye can bear. The other brighter and more simple colours are sparingly bestowed on the flowers of plants; and which, if diffused over all their parts, would have been too glaring, and consequently offensive. The smaller and more elegant parts are adorned with

that brightness which attracts the admiration without endangering the sense.

But while the eye is delighted with the colouring of a flower, the reason may be still more engaged with the natural use and design of a flower in the economy of vegetation. The rudiment of the fruit, when young and tender, requires some covering to protect it; and, accordingly, the flower-leaves surround the seat of fructification: when the sun is warm, they are expanded by its rays, to give the infant fruit the benefit of the heat: to forward its growth when the sun sets, and the cold of the evening prevails, the flower-leaves naturally close, that the air of the night may not injure the seed-vessel. As the fructification advances, and the changes of the air are no longer hurtful, the flower-leaves have answered their end, and so they wither and fall away. How elegant, therefore, as well as apposite, is that allusion in the Gospel; *I say unto you, that Solomon in all his glory was not arrayed like one of these*¹: for the flower, which is the glory of the lily and other plants, is literally and physically a raiment for the clothing of the seed-vessel! And a raiment it is, whose texture surpasses all the laboured productions of art for the clothing of an eastern monarch. The finest works of the loom and the needle, if examined with a microscope, appear so rude and coarse, that a savage might be ashamed to wear them: but when the work of God in a flower is brought to the same test, we see how fibres, too minute for the naked eye, are composed of others still more minute; and they of others; till the primordial threads or first principles of the texture are utterly undiscernible; while the whole substance presents a celestial radiance in its colouring, with a richness superior to silver and gold—as if it were intended for the clothing of an angel. The whole

¹ Matt. vi, 29.

creation does not afford a more splendid object for minute examination than the leaves and filaments of flowers; even of some flowers which look obscure, and promise little or nothing to the naked eye.

But besides this richness of substance and colour, there is an elegance of *design* in the whole form and disposition of a plant, which human artists, in ornamental works, are always studious to imitate. Their leaves, and branches, and flowers, are thrown about with that ease, and turned into beautiful lines, so as to charm the eye with a variety of flexure, and convince us that all the excellence of art must take its pattern from nature².

What white can match the *lily's* virgin snows?
 What red the crimson of the blushing *rose*?
 What regal purple with the *scabius* vie?
 Or scarlet match the *poppy's* flaming dye?
 What yellow, lovely as the golden morn,
 The *lupine* and the *heliotrope* adorn!
 How mixt a hue the streaky *tulip* stains!
 How curious the *carnation's* marbled veins!
 Ethereal blue the silky *violets* wear,
 And all unite their sweets in mingling air.

MOSES BROWNE.

The fields of clover (*trifolium pratense*), which are now in blossom, produce a delightful fragrance. Of this plant there are two varieties, the white and the purple; from the latter, the bees extract much honey. The bean blossoms also shed a still more exquisite odour.

Among the insect tribe, one of the most interesting is, in its perfect state, the angler's may-fly (*ephemera vulgata*), which appears about the 4th, and continues nearly a fortnight. It emerges from the water, where it passes its aurelia state, about six in the evening, and dies about eleven at night. Innu-

² 'The Religious Use of Botanical Philosophy,' a Sermon, in the Rev. William Jones's Works, vol. iv, pp. 3, 4.

merable species of insects are called into life by the heat in this month.

For now in prime of JUNE the burnished fly
Sprung from the meads, o'er which he sweeps along,
Cheered by the breathing bloom and vital sky,
Tunes up amid these airy halls his song;
Soothing at first the gay reposing throng;
And oft he sips their bowl; or, nearly drowned,
He, thence recovering, drives their beds among,
And scares their tender sleep with trump profound,
Then out again he flies, to wing his mazy round.

THOMSON.

Among the most remarkable of the insect tribe may be named the grasshopper (*gryllus*), the golden-green beetle (*scarabæus auratus*), various kinds of flies; the cuckoo-spit insect (*cicada spumaria*), and the stag-beetle (*lucanus cervus*). The several species of the gad-fly (*æstrus bovis—equi—and ovis*), the ox, horse, and sheep gad-fly make their appearance in this month. When attacked by this insect, cattle endeavour to escape their tormentor, by taking refuge in the nearest pond; it being observed, that the gad-fly rarely attacks them when standing in the water.

About the beginning of the month, the pimpernel (*anagallis arvensis*), thyme (*thymus serpyllum*), the bitter sweet nightshade (*solanum dulcamara*), white bryony, the dog-rose (*rosa canina*), and the poppy (*papaver somniferum*), have their flowers full blown. The poppy (says Cowley) is scattered over the fields of corn, that all the needs of man may be easily satisfied, and that bread and sleep may be found together.

The fern-owl may be seen, in the evening, among the branches of oaks, in pursuit of its favourite repast, the fern-chaffer (*scarabæus solstitialis*).

To the OWL.

Grave bird, that, sheltered in thy lonely bower,
On some tall oak with ivy overspread,
Or in some silent barn's deserted shed,
Or mid the fragments of some ruined tower,

Still, as of old, at this sad solemn hour,
 When now the toiling sons of care are fled,
 And the free ghost slips from his wormy bed,
 Complainest loud of man's ungentle power,
 That drives thee from the cheerful face of day
 To tell thy sorrows to the pale-eyed night,
 Like thee escaping from the sunny ray,
 I woo this gloom, to hide me from the sight
 Of that fell tribe, whose persecuting sway
 On Me and Thee alike is bent to light. RUSSELL.

Towards the middle of the month, wheat is in ear, and the flowers of the valerian (*valeriana officinalis*) begin to open. Mullein, viper's bugloss (*echium vulgare*), borage, dog-wood, vervain, the vine (*vitis vinifera*), water hemlock (*phellandrium aquaticum*), and that singular plant, the bee orchis, have their flowers full blown.

Dr. BIDLAKE has prettily described some of the various appearances of Nature in this month :—

A thousand beauties lost to vulgar eyes
 Now to the scrutinizing search are spread;
 The *grasses* elegant, though not proud robed;
 The *mallow*, purpling o'er the pleasant sides
 Of pathways green, mixed with the helpless *vetch*,
 That climbs for aid. Deceitful *nightshade*, dressed
 In hues inviting; every plashy vale,
 Each dry entangled copse, empurpled glows
 With *orchis* blooms; while in the moistened plain
 The *meadow-sweet* its luscious fragrance yields.
 And, ah! what odours from the *hedge-row* breathe,
 When the soft shower calls forth the hidden sweets!
 The *clover* richly feeds the stealthful gale;
 The *strawberry*, blushing, hides its modest face
 Beneath the mantling leaves¹.

The summer solstice happens on the 21st of June, which is the longest day. In the most northern parts of the island, there is scarcely any night at this time, so that a person may read with ease at twelve o'clock at night; the twilight continuing almost from sunrise to sunset.

¹ See 'The Year,' a Poem, p. 112.

Numerous are the flowers and heaths which furnish employment for the industrious *bee* in this and the succeeding months.

He ever busy, still from flow'r to flow'r,
 Stooping their limber stems, the live-long day
 Travels with audible melodious hum.
 Though in ten thousand cells of varied shape
 Her precious balm ingenious nature hides,
 He knows them all, and readily unlocks
 The labiate blossom's close elastic lip,
 To steal the dear ambrosia from within.
 But why, sweet traveller, whose eager lip
 Delights to visit the bloom-sprinkled branch,
 And leave a kiss upon its ev'ry flower,
 Why scorns it to salute the *beauteous rose*,
 And greets his sweet bud never? Partial bird,
 Has MAY alone thy love? and spreads in vain
 JUNE the sweet treasures of her flowery lap?
 Why else untouched upon its thorny stem
 Hangs the *pale rose* unfolding, and the *red*?

HURDIS.

The several kinds of corn come into ear and flower during this month, as well as most of the numerous species of grasses: gooseberries, currants, and *strawberries*¹, also begin to ripen. The hay harvest commences about the end of the month, in the southern and midland parts of the kingdom. About this time,

¹ *To the STRAWBERRY.*

The strawberry blooms upon its lowly bed:
Plant of my native soil! The *lime* may fling
 More potent fragrance on the zephyr's wing,
 The milky *cocoa* richer juices shed,
 The white *guava* lovelier blossoms spread;
 But not, like thee, to fond remembrance bring
 The vanished hours of life's enchanting spring;
Short calendar of joys for ever fled!
 Thou bidst the scenes of childhood rise to view,
 The wild-wood path which fancy loves to trace,
 Where, veiled in leaves, thy fruit, of rosy hue,
 Lurked on its pliant stem with modest grace.
 But, ah! when thought would later years renew,
 Alas! successive sorrows crowd the space.

MISS WILLIAMS.

also, birds cease their notes. No birds are heard after the end of June, except the stone curlew (*charadrius ædicnemus*) whistling late at night; the yellow hammer, goldfinch, and golden-crested wren, now and then chirping. The cuckoo's note also ceases.

The rural employment of *sheep-shearing* commences sometimes early in June, but, at others, not till the middle of the month; the time being regulated by the warmth and settled state of the weather. In many parts of the country, the depriving sheep of their wool is conducted with much ceremony and rural dignity.

The following plants are generally seen in flower about the end of June; goats-beard (*tragopogon pratense*), deadly nightshade (*atropa belladonna*), meadow-sweet (*spiræa ulmaria*), the day-lily (*hemerocallis flava*), the jasmine (*jasminum officinale*), and the holy-oak (*alcea rosea*).

The rose is one of the greatest ornaments of our garden in this month, and although the 'sweetest flower'

That ever bloomed in any bower,

yet, like the rest of its sister tribe, and that beauty of which it is so often mentioned as an emblem, quickly hastens to decay.

Thou blushing Rose, within whose virgin leaves
 The wanton Wind to sport himself presumes,
 Whilst from their rifled wardrobe he receives
 For his wings purple, for his breath perfumes!
 Blown in the morning, thou shalt fade ere noon!
 What boots a life which in such haste forsakes thee?
 Thou'rt wondrous frolic, being to die so soon,
 And passing proud a little colour makes thee.
 If thee thy brittle beauty so deceives,
 Know then, the thing that swells thee is thy bane;
 For the same beauty doth in bloody leaves
 The sentence of thy early death contain.
 Some clown's coarse lungs will poison thy sweet flower,
 If by the careless plough thou shalt be torn,

And many Herods lie in wait each hour,
 To murder thee as soon as thou art born,
 Nay, force thy bud to blow, their tyrant breath
 Anticipating life, to hasten death.

SIR RICHARD FANSHAW¹.

As an appropriate companion to this exquisite sonnet to the 'queen of flowers,' we cannot resist quoting the beautiful address of the Teian bard; we here give a part of it in the free, but elegant, version of Mr. THOMAS MOORE:—

While we invoke the wreathed spring,
 Resplendent Rose! to thee we'll sing—
 Resplendent Rose, the flower of flowers,
 Whose breath perfumes Olympus' bowers;
 Whose virgin blush, of chastened dye,
 Enchants so much our mortal eye.
 When pleasure's bloomy season glows,
 The Graces love to twine the rose;
 The rose is warm Dione's bliss,
 And flushes like Dione's kiss!
 Oft has the poet's magic tongue
 The rose's fair luxuriance sung;
 And long the Muses, heavenly maids,
 Have reared it in their tuneful shades.
 When, at the early glance of morn,
 It sleeps upon the glittering thorn,
 'Tis sweet to dare the tangled fence,
 To cull the timid flow'ret thence,
 And wipe with tender hand away
 The tear that on its blushes lay!
 'Tis sweet to hold the infant stems
 Yet drooping with Aurora's gems,
 And fresh inhale the spicy sighs
 That from the weeping buds arise.
 When revel reigns, when mirth is high,
 And Bacchus beams in every eye,
 Our rosy fillets scent exhale,
 And fill with balm the fainting gale!
 Oh! there is naught in nature bright
 Where roses do not shed their light!
 When morning paints the orient skies,
 Her fingers burn with roseate dyes;
 The nymphs display the rose's charms,
 It mantles o'er their graceful arms;

¹ Ellis's Specimens of the Early English Poets, vol. iii, p. 221.

Through Cytherea's form it glows,
 And mingles with the living snows.
 The rose distils a healing balm,
 The beating pulse of pain to calm;
 Preserves the cold inurned clay,
 And mocks the vestige of decay.
 And when at length, in pale decline,
 Its florid beauties fade and pine,
 Sweet as in youth, its balmy breath
 Diffuses odour even in death !

This beautiful flower, however, experiences a milder fate in more southern climes, particularly in some parts of Italy ; there, the *rose*

Unbent by winds, unchilled by snows,
 Far from the winters of the west,
 By every breeze and season blest,
 Returns the sweets by Nature given
 In softest incense back to heaven ;
 And grateful yields that smiling sky
 Her fairest hue and fragrant sigh.

BYRON².

In this month of flowers, it will not, perhaps, be displeasing to our readers to peruse a slight sketch of the ' History of Flower Gardens,' as well as an account of the extraordinary *tulipomania* of the Dutch in the middle of the seventeenth century.

¹ Odes of Anacreon, by Thomas Moore, p. 188, 4to edit.

² We have yet one more tribute to offer to the beautiful *rose* ; it is from the pen of that great statesman and accomplished scholar, CHARLES JAMES FOX :—

The *Rose*, the sweetly blooming *Rose*,
 Ere from the tree it's torn,
 Is like the charms which Beauty shows,
 In Life's exulting morn !

But, oh ! how soon its sweets are gone,
 How soon it withering lies !
 So when the Eve of Life comes on,
 Sweet Beauty fades and dies :

Then, since the fairest form that's made
 Soon withering we shall find,
 Let us possess what ne'er will fade,
 The beauties of the *Mind* !

It does not appear that either the Greeks or Romans indulged a taste for flowers ; none at least that would imply their having gardens set apart for the culture of these pleasing objects ; or that they ever endeavoured to improve their own wild and indigenous plants, or imported others from foreign countries. We can only consider the florid description of the garden of Alcinous as the effusion of poetry ; and those of Cicero and Pliny were only vineyards with grottos, alcoves, and arbours. It is not in fact above two centuries ago that our own gardens were, probably, in point of taste as well as of products, even inferior to those of the Greeks and Romans : and, for most of the embellishments we now possess of flower-beds, shrubberies, and conservatories, we are indebted to foreign countries.

The nations among whom a taste for flowers was first discovered to prevail in modern times were China, Persia, and Turkey. The vegetable treasures of the eastern world were assembled at Constantinople, whence they passed into Italy, Germany, and Holland ; and from the latter into England : and since botany has assumed the character of a science, we have laid the whole world under contribution for trees and shrubs and flowers, which we have not only made our own, but generally improved in vigour and beauty. The passion for flowers preceded that of ornamental gardening, which still continued to be totally destitute of taste. The Dutch system of straight walks, inclosed by high clipped hedges of yew or holly, every where prevailed ; and tulips and hyacinths bloomed under the sheltered windings of the ' Walls of Troy,' most ingeniously traced in box.

Let not unhallowed shears profane the form,
Which Heaven's own hand, with symmetry divine,
Hath given to all the vegetable tribes.
Banish the regular deformity
Of plans by line and compass, rules abhorred
In nature's free plantations ; and restore

Its pleasing wildness to the garden walk;
 The calm serene recess of thoughtful man,
 In meditation's silent sacred hour.

DODSLEY.

Notwithstanding all the ridicule that has been directed against Brown and Repton, we are certainly indebted to them, in no small degree, for expelling the stiff formality of the Dutch system of ornamental gardening, and enlarging our prospects by the exchange of walls and high trimmed hedges for the sunk-fence. But the person who succeeded best in bringing us back to the point nearest to nature was Kent. It was he who, as Walpole observed, chastened or polished, not transformed, the living landscape:—‘where the united plumage of an antient wood extended wide its undulating canopy, and stood venerable in darkness, Kent thinned the foremost ranks, and left but so many detached and scattered trees as softened the approach of gloom, and blended the chequered light with the thus lengthened shadows of the remaining columns.’ From his time, the taste in pleasure-grounds, shrubberies, and ornamental gardening, has gradually improved, and may now be said to have reached a degree of excellence in this island unrivalled in any other part of the world.

The earliest of these improvements, says the poet,
 was

In *Chiswick's* beauteous model seen,
 In *Richmond's* venerable woods and wilds,
 The calm retreat, where wearied majesty,
 Unbending from his cares for Britain's peace,
 Steals a few moments to indulge his own.
 On *Oatlands' brow*, where grandeur sits enthroned,
 Smiling on beauty. In the lovely vale
 Of *Esher*, where the *Mole* glides lingering, loth
 To leave such scenes of sweet simplicity.
 In *Woburn's* ornamented fields, where gay
 Variety, where mingled lights and shades,
 Where lawns and groves, and opening prospects break,
 With sweet surprise, upon the wand'ring eye:
 On *Hagley's* hills, irregular and wild,
 Where through romantic scenes of hanging woods,

And vallies green, and rocks, and hollow dales,
While echo talks, and nymphs and dryads play,
We rove enamoured.

DODSLEY.

It is certain that no nation on earth can boast that assemblage of various kinds of shrubs and flowers now to be found in Great Britain.

Happy the swain,
Whom taste and nature leading o'er his fields,
Conduct to ev'ry rural beauty. See!
Before his footsteps winds the *waving walk*,
Here gently rising, there descending slow
Through the tall grove, or near the water's brink,
Where *flowers* besprinkled paint the shelving bank,
And *weeping willows* bend to kiss the stream.
Now wandering o'er the lawn he roves, and now
Beneath the *hawthorn's* secret shade reclines;
Where purple *violets* hang their bashful heads,
Where yellow *cowslips*, and the blushing *pink*,
Their mingled sweets and lovely hues combine.

Now lost

Amid a gloomy wilderness of *shrubs*,
The golden *orange*, *arbut* ever green;
The early-blooming *almond*, feathery *pine*,
Fair *opulus*¹, to spring, to autumn dear,
And the sweet shades of varying verdure, caught
From soft *Acacia's* gently waving branch,
Heedless he wanders: while the grateful scents
Of *sweet-briar*, *roses*, *honeysuckles* wild,
Regale the smell; and to th' enchanted eye
Mexereon's purple, *laurustinus* white,
And pale *laburnum's* pendent flowers display
Their different beauties.

DODSLEY.

Most countries have a predilection for some particular plants, while all the rest are disregarded. In Turkey, for instance, the flowers which, after the rose, are principally esteemed, are the ranunculus and the *tulip*, the latter of which grows wild in the Levant; but, through accident, weakness, or disease, few plants acquire so many tints, variegations, and figures, as the *tulip*. This gaudy flower was first cultivated in Italy about the middle of the sixteenth

¹ The guelder rose.

century under the name of *tulipa*, obviously derived from *tuliband*, which, in the Turkish language, signifies a turban.

It is well known that in Holland the tulip became, about the middle of the seventeenth century, the object of a trade unparalleled in the history of commercial speculation. From 1634 to 1637 inclusive, all classes in all the great cities of Holland became infected with the tulipomania. A single root of a particular species, called the Viceroy, was exchanged, in the true Dutch taste, for the following articles—2 lasts of wheat, 4 of rye, 4 fat oxen, 3 fat swine, 12 fat sheep, 2 hogsheads of wine, 4 tuns of beer, 2 tons of butter, 1000 pounds of cheese, a complete bed, a suit of clothes, and a silver beaker,—value of the whole 2500 florins.

These tulips afterwards were sold according to the weight of the roots. Four hundred perits (something less than a grain) of *Admiral Leifken*, cost 4400 florins; 446 ditto of *Admiral Vonder Eyk*, 1620 florins; 106 perits *Schilder* cost 1615 florins; 200 ditto *Semper Augustus*, 5500 florins; 410 ditto *Viceroy*, 3000 florins, &c. The species *Semper Augustus* has been often sold for 2000 florins; and it once happened that there were only two roots of it to be had, the one at Amsterdam, and the other at Haarlem. For a root of this species one agreed to give 4600 florins, together with a new carriage, two grey horses, and a complete harness. Another agreed to give for a root twelve acres of land; for those, who had not ready money, promised their moveable and immoveable goods, houses and lands, cattle and clothes. The trade was followed not only by mercantile people, but also by the first noblemen, citizens of every description, mechanics, seamen, farmers, turf-diggers, chimney-sweeps, footmen, maid-servants, old clothes-women, &c. At first, every one won, and no one lost. Some of the poorest people gained, in a few months, houses, coaches and horses,

and figured away like the first characters in the land. In every town some tavern was selected which served as a change, where high and low traded in flowers, and confirmed their bargains with the most sumptuous entertainments. They formed laws for themselves, and had their notaries and clerks.

These dealers in flowers were by no means desirous to get possession of them; no one thought of sending, much less of going himself to Constantinople to procure scarce roots, as many Europeans travel to Golconda and Visipour to obtain rare and precious stones. It was in fact a complete stock-jobbing transaction. Tulips of all prices were in the market, and their roots were divided into small portions, known by the name of *perits*, in order that the poor as well as the rich might be admitted into the speculation: the tulip root itself was out of the question—it was a non-entity; but it furnished, like our funds, the subject of a bargain for time.

During the time of the tulipomania, a speculator often offered and paid large sums for a root which he never received, and never wished to receive. Another sold roots which he never possessed or delivered. Often did a nobleman purchase of a chimney-sweep tulips to the amount of 2000 florins, and sell them at the same time to a farmer, and neither the nobleman, chimney-sweep, nor farmer, had roots in their possession, or wished to possess them. Before the tulip season was over, more roots were sold and purchased, bespoke, and promised to be delivered, than in all probability were to be found in the gardens of Holland; and when *Semper Augustus* was not to be had, which happened twice, no species perhaps was oftener purchased and sold. In the space of three years, as Munting tells us, more than ten millions were expended in this trade, in only one town of Holland.

The evil rose to such a pitch, that the states of Holland were under the necessity of interfering; the buyers took the alarm; the bubble, like the South

Sea scheme, suddenly burst ; and as, in the outset, all were winners, in the winding up, very few escaped without loss ¹.

Some persons are so fond of odoriferous plants and flowers, as to have them in their bed-chamber. This, however, is a dangerous practice, many of them being so powerful as to overcome the senses entirely. Even plants that are not in flower, and have no smell, yet injure the air during the night, and in the absence of the sun, by impregnating it with nitrogen and carbonic acid gas ; although in the daylight they rather improve the atmosphere, by yielding oxygen gas.

A melancholy proof of this occurred in October, 1814, at Leighton-Buzzard, in Bedfordshire. ' Mr. Sherbrook having frequently had his pinery robbed, the gardener determined to sit up and watch. He accordingly posted himself with a loaded fowling piece in the green-house, where it is supposed he fell asleep, and in the morning was found dead upon the ground, with all the appearance of suffocation, evidently occasioned by the discharge of *mephitic gas* from the plants during the night ².'

Mackerel (*scomber, scomber*) are taken in great abundance in this month. Such is sometimes the profusion of this fish, that a single boat has been known to take 120,000. The price on the spot, to those who purchased them for sale, was half a guinea per thousand. Nothing can be more interesting and pleasing to the eye than to see them, just caught, brought to shore by the fishermen, and spread, with all their radiancy, upon the pebbles of the beach, at the first rays of the rising sun ; but they are no sooner

¹ See Professor Beckmann's History of Inventions, vol. iii, p. 1 ; vol. i, p. 43 ; the Quarterly Review, vol. xiv, p. 408 ; and an elegantly written paper on Gardening, in the ' *Contemplative Philosopher*,' vol. i, No. xxvii.

² Dr. Curry on Apparent Death, p. 181, second edit.

taken out of their element than they die : the following lines allude to this peculiarity :—

When motionless he lies flat on the strand,
 Ah ! what avails, that Nature's skilful hand
 Had decked his glossy cheeks with silv'ry light,
 Mixed to the changing hues of opal bright ;
 That on his back, with sable ribands graced,
 His native waves seem curiously traced ;
 That, chased in purest gold, his sparkling eyes
 Reflect the moving features of the skies ;
 If vital air supplies him not with breath,
 And what gives life to others, gives him death ?

The maritime plants which flower this month, are, the sea-barley (*hordeum maritimum*), sulphur-wort (*pucedanum officinale*), and loose sedge (*carex distans*), in salt marshes ; the sea-plantain (*plantago maritima*), among rocks on the sea-coast ; the slender-leaved buffonia (*buffonia tenuifolia*), and the tassel pond-weed (*ruppia maritima*), in salt water ditches. To these may be added, the common alkanet (*anchusa officinalis*), the narrow-leaved pepperwort (*lepidum ruderale*), and the Roman nettle (*urtica pilulifera*), in sea wastes ; the black salt-wort (*glaux maritima*), on muddy shores ; the sea-chickweed (*arenaria peploides*), and the common sea-rocket (*bunias cakile*), on sandy shores ; and the perfoliate cabbage (*brassica orientalis*) among maritime rocks.

Among numerous other vegetables, the produce of the kitchen garden, in this month, we may observe

The martial pea,
 In column square arranged, line after line
 Successive ; the gay bean, her hindmost ranks
 Stript of their blossoms ; the thick-scattered bed
 Of soporific lettuce ; the green hill
 Covered with cucumbers.

Having already given the two elegies of the ' Swallows' and ' Goldfinches,' by Jago (see pp. 128, 158), we shall complete the series of these elegant poems

¹ See M'Quin's Description of 300 Animals, p. 261.

by subjoining the 'BLACKBIRDS,' an Elegy, equally pleasing with the other productions of this ingenious poet.—See Dr. Aikin's opinion of their merit, at p. 127.

The BLACKBIRDS; an ELEGY.

The sun had chased the mountain snow,
His beams had pierced the stubborn soil,
The melting streams began to flow,
And ploughmen urged their annual toil:

'Twas then, amid the vocal throng
Whom nature waked to mirth and love,
A blackbird raised his amorous song,
And thus it echoed through the grove:

'O fairest of the feathered train!
For whom I sing, for whom I burn,
Attend with pity to my strain,
And grant my love a kind return.

'For see, the wintry storms are flown,
And zephyrs gently fan the air;
Let us the genial influence own,
Let us the vernal pastime share.

'The Raven plumes his jetty wing,
To please his croaking paramour;
The Larks responsive carols sing,
And tell their passion as they soar:

'But does the Raven's sable wing
Excel the glossy jet of mine?
Or can the Lark more sweetly sing,
Than we, who strength with softness join?

'O let me then thy steps attend!
I'll point new treasures to thy sight:
Whether the grove thy wish befriend,
Or hedge-rows green, or meadows bright.

'I'll guide thee to the clearest rill,
Whose streams among the pebbles stray;
There will we sip, and sip our fill,
Or on the flowery margin play.

'I'll lead thee to the thickest brake,
Impervious to the school-boy's eye;
For thee the plastered nest I'll make,
And to thy downy bosom fly.

' When, prompted by a mother's care,
Thy warmth shall form th' imprisoned young,
The pleasing task I'll gladly share,
Or cheer thy labours with a song.

' To bring thee food I'll range the fields,
And cull the best of every kind,
Whatever Nature's bounty yields,
And Love's assiduous care can find.

' And when my lovely mate would stray,
To taste the summer sweets at large,
I'll wait at home the live-long day,
And fondly tend our little charge.

' Then prove with me the sweets of love,
With me divide the cares of life ;
No bush shall boast in all the grove,
A mate so fond, so blest a wife !'

He ceased his song—the plummy dame
Heard with delight the love-sick strain,
Nor long concealed a mutual flame,
Nor long repressed his amorous pain.

He led her to the nuptial bow'r,
And perched with triumph by her side ;
What gilded roof could boast that hour
A fonder mate, or happier bride ?

Next morn he waked her with a song,
' Behold (he said) the new-born day,
The Lark his matin-peal has rung ;
Arise, my love, and come away !'

Together through the fields they strayed,
And to the murmuring rivulet's side ;
Renewed their vows, and hopped, and played,
With artless joy and decent pride.

When O ! with grief my Muse relates
What dire misfortune closed the tale ;
Sent by an order from the Fates,
A *Gunner* met them in the vale.

Alarmed, the lover cried, ' My dear,
Haste, haste away, from danger fly ;
Here, Gunner, point thy thunder here ;
O spare my love, and let me die !'

R

At him the Gunner took his aim,
 Too sure the volleyed thunder flew !
 O had he chose some other game,
 Or shot—as he was wont to do !

Divided Pair ! forgive the wrong,
 While I with tears your fate rehearse ;
 I'll join the Widow's plaintive song,
 And save the Lover in my verse.

JAGO.

JULY.

THIS word is derived from the Latin *Julius*, the surname of C. Cæsar, the dictator, who was born in it. Mark Anthony first gave to this month the name of July, which was before called *Quintilis*, as being the fifth month in the year, in the old Roman calendar established by Romulus. July was called by the Saxons, *heu-monat*, or *hey-monat*, because therein they usually mowed, and made their hay-harvest.

Remarkable Days.

2.—VISITATION OF THE BLESSED VIRGIN MARY.

THIS festival was instituted by Pope Urban VI, in commemoration of that remarkable journey which the Mother of our Lord took into the mountains of Judæa, in order to visit the mother of St. John the Baptist.

3.—DOG-DAYS BEGIN.

These are a certain number of days before and after the heliacal rising of *Canicula*, or the dog-star, in the morning. The dog-days in our modern Almanacks occupy the time from July 3d to August 11th; the name being applied now, as it was formerly, to the hottest time of the year.

4.—TRANSLATION OF SAINT MARTIN.

This day was appointed to commemorate the removal or translation of St. Martin's body from one tomb to another much more noble and magnificent ; an honour conferred upon the deceased saint by Perpetuus, one of his successors in the see of Tours. His festival is celebrated on the 11th of November, which see.

*6. 1189.—RICHARD I BEGAN TO REIGN.

The most shining part of this prince's character was his military talents ; no man ever in that romantic age carried courage and intrepidity to a greater height ; and this quality gained him the appellation of the lion-hearted, *cœur de lion*. He passionately loved glory ; and, as his conduct in the field was not inferior to his valour, he seems to have possessed every talent necessary for acquiring it : his resentments also were high, his pride unconquerable, and his subjects, as well as his neighbours, had therefore reason to apprehend, from the continuance of his reign, a perpetual scene of blood and violence. Of an impetuous and vehement spirit, he was distinguished by all the good as well as the bad qualities which are incident to that character. He was open, frank, generous, sincere, and brave ; he was revengeful, domineering, ambitious, haughty, and cruel, and was thus better calculated to dazzle men by the splendour of his enterprizes, than either to promote their happiness, or his own grandeur, by a sound and well-regulated policy. As military talents make great impression on the people, he seems to have been much beloved by his English subjects ; and he is remarked to have been the first prince of the Norman line who bore a sincere affection and regard for them. He passed, however, only four months of his reign in that kingdom ; the crusade employed him near three years : he was detained about four months in captivity ; the rest of his reign was spent either in war, or preparations for war, against France : and he

was so pleased with the fame which he had acquired in the east, that he seemed determined, notwithstanding all his past misfortunes, to have further exhausted his kingdom, and to have exposed himself to new hazards, by conducting another expedition against the infidels.—*Hume*.

7.—THOMAS A BECKET.

This haughty prelate was born in London, in the year 1119, and was the son of Gilbert, a merchant, and Matilda, a Saracen lady, who is said to have fallen in love with him when he was a prisoner to her father in Jerusalem. In 1159 he made a campaign with King Henry into Toulouse, having in his own pay 1200 horse, besides a retinue of 700 knights or gentlemen.

*7. 1816.—RICHARD BRINSLEY SHERIDAN DIED.

Ye orators! whom yet our councils yield,
Mourn for the veteran Hero of your field.
The worthy Rival of the wondrous *three* ¹;
Whose words were sparks of immortality!
Ye bards!—to whom the Drama's Muse is dear,
He was your Master! emulate him *here* ²!—
Ye men of wit and social eloquence!
He was your brother! bear his ashes hence!—
While powers of mind, almost of boundless range,
Complete in kind—as various in their change;
While eloquence—wit—poesy—and mirth,
That humbler harmonist of care on earth,
Survive within our souls—while lives our sense
Of pride in merit's proud pre-eminence,
Long shall we seek his likeness—long, in vain,
And turn to all of him which may remain,
Sighing that Nature formed but one such man,
And broke the die—in moulding SHERIDAN.

*12. 1536.—ERASMUS DIED.

¹ Fox, Pitt, and Burke.

² Drury Lane Theatre, where the whole of this monody was delivered.

*14. 1789.—THE BASTILLE DESTROYED.

Ye horrid tow'rs, th' abode of broken hearts !
 Ye dungeons, and ye cages of despair !
 There's not an English heart that would not leap,
 To hear that ye were fall'n at last—to know
 That ev'n our enemies, so oft employed
 In forging chains for us, themselves were free.

COWPER.

15.—SAINT SWITHIN.

Swithin, in the Saxon *Swithum*, received his clerical tonsure, and put on the monastic habit, in the old monastery at Winchester: he was of noble parentage, and passed his youth in the study of grammar, philosophy, and the scriptures. Swithin was promoted to holy orders by Helmstan, Bishop of Winchester; at whose death, in 852, King Ethelwolf granted him the see. In this he continued eleven years, and died in 868. For some verses on the popular superstition respecting this day, see our last volume, p. 189.

*18. 1374.—PETRARCH DIED.

Petrarch thus describes his retirement to Vacluse: Here (says he) I make war upon my senses, and treat them as my enemies. My eyes, which have drawn me into a thousand difficulties, see no longer either gold or precious stones; or ivory or purple; they behold nothing, save the firmament, the water, and the rocks. The only female who comes within their sight, is a swarthy old woman, dry and parched as the Lybian deserts. My ears are no longer courted by those harmonies of instruments or voices which have often transported my soul; they hear nothing but the lowing of cattle, the bleating of sheep, the warbling of birds, and the murmurs of the stream.

I keep silence from morn to night. There is no one to converse with; for people constantly employed, either in spreading their nets, or taking care of their vines and orchards, have no knowledge of the intercourses of the world, or the conversations of society. I often content myself with the brown

bread of my old fisherman, and even eat it with pleasure; and when I am served with white, I almost always return it.

This old fisherman, who is as hard as iron, earnestly remonstrates against my manner of life; says it is too hardy, and assures me I cannot long hold out. I am, on the contrary, convinced, that it is more easy to accustom one's self to a plain diet, than to the luxuries of a feast. Figs, raisins, nuts, and almonds, these are my delicacies. I am fond of the fish with which this river abounds: it is an entertainment to see them caught, and I sometimes employ myself in spreading the nets. As to my dress, here is an entire change; you would take me for a labourer or a shepherd.

My mansion resembles that of Cato, or Fabricius: my whole household consists of a dog and my old fisherman. His cottage is contiguous to mine. When I want him, I call; when I no longer stand in need of him, he returns to his cottage. I have made myself two gardens, which please me marvellously; I do not think they are to be equalled in all the world. And must I confess to you a more than female weakness with which I am haunted? I am positively angry that there is any thing so beautiful out of Italy. They are my Transalpine Parnassus. See *Mrs. Dobson's Life of Petrarch*, vol. i, p. 110.

20.—SAINT MARGARET.

She was born at Antioch, and was the daughter of a Pagan priest. She was first tortured, and then beheaded, in the year 278.

*21. 1796.—ROBERT BURNS DIED.

TO MARY IN HEAVEN.

Thou lingering star, with less'ning ray,
That lov'st to greet the early morn,
Again thou usher'st in the day
My Mary from my soul was torn.

O Mary! dear departed shade!
 Where is thy place of blissful rest?
 Seest thou thy lover lowly laid?
 Hear'st thou the groans that rend his breast?

That sacred hour can I forget,
 Can I forget the hallowed grove,
 Where by the winding Ayr we met,
 To live one day of parting love!

Eternity will not efface
 Those records dear of transports past;
 Thy image at our last embrace;
 Ah! little thought we 'twas our last!

Ayr gurgling kissed his pebbled shore,
 O'erhung with wild woods, thickening, green;
 The fragrant birch, and hawthorn hoar,
 Twined amorous round the raptured scene.

The flowers sprang wanton to be prest,
 The birds sang love on every spray,
 Till too, too soon, the glowing west
 Proclaimed the speed of winged day.

Still o'er these scenes my mem'ry wakes,
 And fondly broods with miser care;
 Time but th' impression stronger makes,
 As streams their channels deeper wear.

My Mary, dear departed shade!
 Where is thy place of blissful rest?
 Seest thou thy lover lowly laid?
 Hear'st thou the groans that rend his breast?

22.—MARY MAGDALEN.

This day was first dedicated to the memory of St. Mary Magdalen, by King Edward VI; and in his Common Prayer, the *Gospel* for the day is from St. Luke, chap. vii, verse 36. Our reformers, however, upon a more strict inquiry, finding it doubtful whether this woman, mentioned in the Gospel, was really Mary Magdalen, thought it prudent to discontinue the festival.

¹ This sublime and tender elegy will be found in Cromek's *Reliques of Burns*; and in *Burns's Works*, vol. i, p. 125, 8vo edit., 1809.

***22. 1812.—BATTLE OF SALAMANCA.**

*Inscription on the Bed of the Carriage of the Mortar placed in
St. James's Park.*

To commemorate
The Raising of the Siege of Cadiz in consequence of the
Glorious Victory obtained by the
DUKE OF WELLINGTON
Over the French near Salamanca on the
22d July MDCCCXII,
This Mortar, cast for the Destruction of that
Great Port,
With Powers surpassing all others,
And abandoned by the Besiegers on their Retreat,
Was presented as a Token of Respect and Gratitude by the
SPANISH NATION
To His Royal Highness the Prince Regent.

23. 1588.—FIRST NEWSPAPER PUBLISHED.*25.—SAINT JAMES.**

James was by birth a Galilean, and partner with Peter in fishing, from which our Lord called him to be one of his disciples: Of his ardent zeal, no other proof is necessary, than his becoming the victim of Herod Agrippa. The Spaniards esteem James their tutelar saint.

26.—SAINT ANNE.

She was the mother of the Virgin Mary, and the wife of Joachim her father. Her festival is celebrated by the Latin church.

26. 1772.—JAMES GRÆME DIED.**31. 1788.—REV. THOMAS RUSSELL DIED.****To VALCLUSA.**

What though, Valclusa, the fond bard be fled,
That wooed his fair in thy sequestered bowers,
Long loved her living, long bemoaned her dead,
And hung her visionary shrine with flowers!
What though no more he teach thy shades to mourn
The hapless chances that to love belong,
As erst, when drooping o'er her turf forlorn,
He charmed wild Echo with his plaintive song?
Yet still, enamoured of the tender tale,
Pale Passion haunts thy grove's romantic gloom,

Yet still soft music breathes in every gale,
Still undecayed the fairy-garlands bloom,
Still heavenly incense fills each fragrant vale,
Still *Petrarch's* Genius weeps o'er *Laura's* tomb.

RUSSELL.

Astronomical Occurrences

In JULY 1817.

THE Sun enters Leo on the 23d of this month, at 22 m. after 7 in the morning; and the times of his rising and setting on every 5th day during the same period are exhibited in the following

TABLE

Of the Sun's rising and setting for every fifth Day of July.

Tuesday,	July 1st,	Sun rises 46 m. after 3.	Sets 14 m. after 8
Sunday,	— 6th,	. . . 49 . . . 3 . . . 11 . . . 8	
Friday,	— 11th,	. . . 53 . . . 3 . . . 7 . . . 8	
Wednesday,	— 16th,	. . . 57 . . . 3 . . . 3 . . . 8	
Monday,	— 21st,	. . . 3 . . . 4 . . . 57 . . . 7	
Saturday,	— 26th,	. . . 10 . . . 4 . . . 50 . . . 7	
Thursday,	— 31st,	. . . 18 . . . 4 . . . 42 . . . 7	

In order to obtain the true time from apparent, the quantities in the following Table must be added to the time given by a good sun-dial.

TABLE

Of the Equation of Time for every fifth Day of the Month.

	m.	s.
July 1st, to the time by the dial add	3	19
6th,	4	14
11th,	5	0
16th,	5	36
21st,	5	59
26th,	6	7
31st,	6	0

The Moon enters her last quarter at 25 m. past 9 in the morning of the 6th of July; there will be

a new Moon at 17 m. after 10 in the morning of the 14th; the first quarter will commence at 56 m. after 11 in the morning of the 21st; and she will be full at 22 m. past 8 in the morning of the 28th of the month.

The Moon may be seen on the meridian at the following times, during the present month:—

July 25th,	at 45 m. after	9	in the evening.
26th,	46 . .	10	
27th,	45 . .	11	

The planet Mercury will attain his greatest elongation on the 6th of the present month. The Moon and Mars will be in conjunction at 1 m. past 11 in the evening of the 7th. Jupiter and the star marked β in Scorpio will be in conjunction on the 14th, the star being then $17\frac{1}{2}$ north of the planet. The Moon will also be in conjunction with the star marked α in Libra at 4 m. past 1 in the morning of the 22d; and Jupiter will appear stationary on the 28th.

The eclipses of Jupiter's satellites that will be visible this month at the Royal Observatory, are the following, which are calculated for true time.

EMERSIONS.

1st Satellite,	July 4th,	at 53 m. after	9	in the evening.
.	27th	12 . .	10	
2d Satellite,	. 14th	42 . .	10	

There will also be one visible eclipse of Jupiter's third satellite this month; and the emersion will take place at 18 m. past 9 in the evening of the 29th.

On the Orbits, Motions, Magnitudes, and Distances of the Earth and Moon.

[Concluded from p. 175.]

FROM what has been explained in the former part of this article, it is easy to trace the orbit of the Earth on a plane surface. Having fixed upon a point S (fig. 6) for the place of the Sun, let a series

of right lines be drawn from it, forming, with each other, the angles that are described daily. Then, as these lines would pass through the centres of the Earth and Sun at those respective times (each noon for instance), from S on each of these lines set off the corresponding radii vectores, SG, SE, SE', &c. and through all these points G, E, E', &c. describe a curve line, which will be the ecliptic, or the orbit described by the Earth in its annual revolution round the Sun. This curve is an ellipse, in which CA or CP is the *mean distance*; and GH, perpendicular to AP at the centre C, is the *less axis*: and since GS is equal GF, and their sum is AP, SG is therefore equal to CP, that is, to the mean distance. Finally, CS or CF is what is called the *excentricity*, which is the difference between the mean radius CP and the greatest distance AS, or the least, SP.

It is this elliptic orbit which the Earth describes in the course of a year; and, in order to determine the actual duration of that period, astronomers have carefully observed the *secular movement* of the Sun, or the arc described by his apparent motion during 100 Julian years, which M. *Delambre* has determined to be equal to $36000^{\circ}.7625$ very nearly. Then the tropical year is readily obtained by a simple proportion; for the arc described by the apparent movement of the Sun in 100 years, is to 360 degrees, as the number of days in 100 years is to the time of making one revolution or describing 360 degrees; viz.

as $36000^{\circ}.7625 : 360^{\circ} :: 36525^d : 365^d.242264$;

hence the exact length of the tropical year, according to this statement, is 365 days 5 hours 48 minutes and 51.6 seconds.

THE MOON..

It is by observing the appearances which the Moon presents, and submitting them to analysis, that we ascertain the laws of her movement, and the

numerous irregularities to which it is subject. These methods we shall now endeavour briefly to explain.

The variations to which the apparent diameter of the Moon is subject, indicate that her distance from the Earth is considerably greater at one time than another. These variations may either be ascertained by observation, and directly measured by means of the micrometer, or found from the times which elapse between the immersions and emersions in occultations of the stars, by the Moon in her passage round the Earth. The greatest apparent diameter of the Moon has been determined by various methods, and found to be $2011''.068$ or $33'.5178$; and the least equal $1761''.912$ or $29'.3652$. The analogous values for the sun are $1955''.567$ or $32'.5928$, and $1890''.961$ or $31'.516$. Hence the variations in the distance of the Moon from the Earth are greater than those in the distance of the Earth from the Sun; since the apparent diameter of the Moon is sometimes greater than the greatest, and at others less than the least, apparent diameter of the Sun.

Observations of the parallaxes also confirm this result. By comparing the parallaxes of the Moon observed at the same place, but at different times, considerable variations have been found. The greatest horizontal parallax of the Moon for 48° or 50° of latitude, is $1''.0248$, and the least $0''.8975$; and it takes successively all possible values between these extremes.

Now, calculating the greatest and least distance of the Moon from the Earth, according to these given quantities, we obtain the following results in terrestrial radii:—

Parallaxes.	Distances.
$0''.8975$	63.8419
$1''.0248$	55.9164

The arithmetical mean between these two extremes is 59.87915 , that is about 60 times the radius of the

Earth in the same latitude. If the greatest distance be divided by the least, the quotient 1.1417 will give the greatest variations to which the distance between the Earth and the Moon is subject. The same result may likewise be obtained by dividing the extreme parallaxes, the one by the other; for these are inversely as the distances. The ratio found in the same manner for the Sun is 1.034; and the union of these two results leads to two important consequences, viz.—The Moon is very near the Earth in comparison with the Sun, and the variations it experiences in its distance are proportionally much greater than those of the Sun.

The lunar parallax not only varies for different epochs, in consequence of these inequalities, but its value is not the same at the same time, when observed at different places of the Earth's surface. Modern observations give sensible differences in this respect. In order to comprehend these consequences, it must be recollected that the horizontal parallax of the Moon is the angle which a radius of the Earth, drawn from the centre to the observer, subtends at the Moon. Since this parallax is not the same at different places at the same epochs, it proves that the radii of the Earth are not all equal to each other, and consequently that the surface of the Earth is not spherical. Hence the Moon, by the variations in its parallax, indicates the inequalities of the Earth's surface, as well as proves its general sphericity by its eclipses. The inequalities of these radii have therefore an influence upon the apparent positions of the Moon when observed from different latitudes. These inequalities must be taken into the account when the apparent position of the Moon is required to be calculated with great accuracy; as in the occultations of the stars.

By dividing the apparent semidiameter of the Moon, reduced to the centre of the Earth, by its horizontal parallax for any given place, the result

will give a constant ratio. This ratio is that which subsists between the radius of the Moon and the radius of the Earth, considered as spherical. According to the best observations, the value of this ratio for the equator is 0.24564, by taking $0^{\circ}.27298$ for the semidiameter reduced to the centre of the Earth, when the parallax is $0^{\circ}.9999$, or very nearly 1° . This result being once obtained, it will serve for calculating the apparent diameter when the horizontal parallax is known; or, reciprocally, for determining the parallax when the diameter is given.

In the diurnal revolution of the Moon about the Earth, she approaches nearer to an observer situated on its surface when she is in his zenith than in the horizon. This difference, it has already been observed, produces a sensible effect upon her apparent diameter, which increases with her altitude. This augmentation is easily calculated, and its total value from the horizon to the zenith is about $\frac{1}{80}$ th, since the distance between the observer and the Moon is diminished by a quantity nearly equal to the radius of the Earth, which is very nearly a 60th part of the mean distance.

The Moon moves in an elliptical orbit, of which the Earth, occupies one of the foci, and she accompanies the Earth in its annual orbit round the Sun. In the preceding figure, E represents the Earth, M the Moon, *mMo* the lunar orbit, and EM the radius vector of that orbit. This radius vector, in its motion round the point E, describes areas which are nearly proportional to the times of description. The mean distance of this body being taken for unity, the excentricity of its orbit in 1800 was 0.0548553; and the method by which this result is deduced from observation is the same as employed for the solar orbit. The revolution of the Moon with respect to her apsides, called the *anomalistic* revolution, is performed in 27.5546 days.

The orbit of the Moon is oblique to the equator

and to the ecliptic ; its inclination to the latter plane varies within small limits, which may easily be determined ; and its mean value is about $5^{\circ}.14998$. The differences of these values at each revolution may be immediately found from observation, by determining the greatest latitude of the Moon, in the same manner as the obliquity of the ecliptic is found from the greatest declination of the Sun.

The mean arc which the Moon describes parallel to the ecliptic in a hundred Julian years, constitutes what is called its *secular tropical movement*. In 1800, this arc was very nearly $481267^{\circ}.8793$; and which divided by the number of days in 100 years, or 36525, gives the tropical motion equal to $13^{\circ}.17636$; and hence this motion of the Moon is about thirteen times as great as that of the Sun.

From these given quantities, the time in which the Moon returns to the same longitude, or her *periodic revolution*, may be easily found by proportion ; for as $481267^{\circ}.8793 : 360^{\circ} :: 36525 \text{ days} : 27.32158 \text{ days}$, which is denominated the *lunar month*.

If from the secular tropical motion the precession of the equinoxes for a century be subtracted, the remainder will be the *secular sidereal movement*, or that of the Moon with respect to the stars ; for the motion of the stars and that of the Moon, with respect to the equinoxes, are both in the same direction, and, therefore, their relative motion is equal to the difference of the arcs described in the same time. Now, as the precession of the equinoxes in a century is equal $5010''.012$ or $1^{\circ}.39167$, and which taken from the secular tropical movement, gives $481266^{\circ}.4876$ for this movement in 100 years ; and, therefore, by a proportion in all respects similar to that above by which the lunar month is obtained, we have 27.32166 days for the *sidereal revolution*. These two revolutions are therefore connected together by the equinoxes, and consequently may readily be deduced the one from the other. They have not always had the

preceding values ; but gradually diminish a little every century, because the motion of the Moon is accelerated ; and these changes become sensible after considerable intervals of time.

In general the movement of the Moon, like that of the Sun, is composed of a small number of elements, the mean value of which is very nearly the same, with several *secular* inequalities, which operate gradual changes in these values at long periods of time ; and a great number of smaller inequalities which are successively destroyed and re-established in short periods. These last sometimes accelerate and at others retard the lunar motion ; while the secular inequalities preserve a constant progress of either increase or decrease for a great number of centuries, before their periods are accomplished, and their effects recommence. Our limits, however, preclude us from attempting any explanation of these perturbing causes ; and we must therefore refer such of our readers as are desirous of becoming acquainted with them, to *Vince's complete System of Astronomy* ; or, *Biot's Traité élémentaire d'Astronomie Physique* ; from which we have derived many of the statements contained in this article.

We have already explained (see T. T. for 1814, p. 180), that by the word *node* is to be understood the points where the orbit of the Moon and the ecliptic cross each other. These points are also determined by observing the instant when the latitude of the Moon is nothing. The nodes are not fixed points in the heavens, but have a slow retrograde motion. At the commencement of the present century, the distance of the ascending node from the vernal equinoctial point was $15^{\circ}.92397$; and which therefore determines the position of the lunar orbit for that epoch.

The preceding observations relate to the proper motion of the Moon ; that of its nodes is ascertained in the same manner, by the differences of their longitude

at different epochs. The time which they employ in returning to the same longitude, gives the *tropical revolution of the node*. The mean secular and tropical movement, in 1800, was $1936^{\circ}.94073$, which gives 6788.5492 days for their tropical, and 6793.4212 days for their sidereal revolution. This motion of the nodes, however, is not uniform, but, like that of the Moon, subject to several small irregularities.

Having given some account of the phases of the Moon in a former volume (see T. T. for 1814, p. 180), we shall now offer a brief explanation of the principles upon which they depend; and these principles are very simple when we only take into the account the mean movements. If the motions of the Sun and Moon were exactly the same, we should always see the same phase of the latter. The distance, on a circle of latitude at which the Moon is observed, at any time, from the Sun, is equal to the excess of her movement in longitude. Now the mean secular movement of the Sun, as stated in the preceding part of this article, is $36000^{\circ}.7625$; that of the Moon is now equal to $481267^{\circ}.8793$; their difference, $445267^{\circ}.116799$, is the quantity which the Moon removes from the Sun in 100 Julian years, in consequence of its mean motion. Whence by a simple proportion, in the same manner as before explained, we obtain 29.530588 days for the *synodic revolution*, or *lunar month*.

In the same manner, also, the time elapsed between two consecutive returns of the Sun to the node of the lunar orbit may be found. The secular movement of the node is $1934^{\circ}.18748$, that of the Sun is as stated above. Now as their motions are in opposite directions, the relative movement is equal to their sum, or $37934^{\circ}.94998$. This is the quantity which the Sun and the node are removed from each other in 100 years; from which it is concluded that they separate 360° in 346.61963 days; and this period is denominated the *synodic revolution of the node*. This

period is less than the tropical year, because the motion of the node is retrograde, and the Sun meets it before he has completed one entire circle of the heavens. As the calculations are founded upon the mean quantities, these results will be in some measure affected by the lunar inequalities, but they will never be far from the true values.

Several other points relative to the lunar orbit deserve attention; such as those where the radius vector coincides with the radius vector of the Sun; then the two bodies, together with that of the Earth, are in the same plane perpendicular to that of the ecliptic, and the longitude of the Moon is either the same as that of the Sun, or 180° different from it. These points are called the *syzigies*. When the Moon is in these, it is either situated between the Sun and the Earth, or the Earth is between it and the Sun; in the former case the Moon is said to be in *conjunction*, in the latter, in *opposition*.

It is in the conjunctions which new Moons and eclipses of the Sun take place. In order that these latter phenomena may happen, it is not absolutely necessary that the Moon should be in the plane of the ecliptic; it is sufficient that her distance from it is less than the apparent semidiameter of the Sun. On the contrary, the moment of opposition is that of full Moon, and it is near that epoch that eclipses of the Moon happen. In order that these may occur, the distance of the Moon from the plane of the ecliptic must not exceed the semidiameter of the Earth's shadow at that distance.

In the next article of our observations we shall explain the method of calculating the extent of this shadow, and of determining the circumstances under which the Moon will be immersed in it, with other particulars relative to the eclipses of the two great luminaries.

The Naturalist's Diary.

Now comes JULY, and with his fervid noon
Unsinews labour. The swinkt mower sleeps;
The weary maid rakes feebly; the warm swain
Pitches his load reluctant; the faint steer,
Lashing his sides, draws sulkily along
The slow-encumbered wain.

HURDIS.

SUMMER may be said to commence with this month. In May and June, the Spring glowed with all the mixtures of 'colorific radiance,' but now opening beauty and increasing variety are succeeded by the more uniform scenes of maturity and perfection. Nature, in our temperate regions, appears now to have nearly finished her annual work. Something of her variety she begins to lose in this season. Nothing, indeed, can be more beautiful than the verdure of the orchards and woods, but the shades of hue which they exhibit are no longer so agreeable. The meadows begin to whiten, and the flowers that adorn them are mowed down. The corn gradually assumes a yellow hue, and the colours that decorate the rural scene are no longer so numerous.

Groves, fields, and meadows, which charm us so much in the SPRING, when they are all new and fresh, with their first gloss upon them, in the Summer, and in proportion as we advance towards Autumn, lose insensibly their pleasing effects; the song of the nightingale is no longer heard; and that favourite enjoyment of the country, a walk through fields of verdure, becomes inconvenient and unpleasing, on account of the great heat which sometimes prevails;

Yet SUMMER has still inexpressible charms, and exhibits proofs every day of the unbounded goodness of the Great Creator. It is that season of felicity in which he dispenses his blessings more abundantly to every living creature. Nature, after having reanimated and enlivened us by all the pleasures of the Spring, is incessantly employed, during the Summer, to provide those enjoyments which are most agreeable to the

senses, to facilitate the means of subsistence, and to excite in our breasts the correspondent sentiments of gratitude and love.

Hay-making, which usually commences about this time, or rather earlier, in fine seasons, is thus pleasingly described by Dodsley, in his 'AGRICULTURE,' a poem :—

The ripening mead
Calls forth the labouring hinds ; in slanting rows,
With still-approaching step, and levelled stroke,
The early *mower*, bending o'er his scythe,
Lays low the slender grass ; emblem of man,
Falling beneath the ruthless hand of time.
Then follows blithe, equipt with fork and rake,
In light array, the train of nymphs and swains :
Wide o'er the field, their labour seeming sport,
They toss the withering herbage. Light it flies,
Borne on the wings of zephyr ; whose soft gale,
Now while th' ascending sun's bright beam exhales
The grateful sweetness of the new-mown hay,
Breathing refreshment, fans the toiling swain.
And soon the jocund dale and echoing hill
Resound with merriment. The simple jest,
The village tale of scandal, and the taunts
Of rude unpolished wit, raise sudden bursts
Of laughter from beneath the spreading oak,
Where thrown at ease, and sheltered from the sun,
The plain repast and wholesome bev'rage cheers
Their spirits. Light as air they spring renewed
To social labour : soon the ponderous wain
Moves slowly onwards with its fragrant load,
And swells the barn capacious : or, to crown
Their toil, large tapering pyramids they build,
The magazines of plenty, to ensure
From winter's want the flocks and lowing herds.

July is generally accounted the hottest month in the year. In consequence of the excessive heat, an evaporation takes place from the surface of the earth and waters, and large clouds are formed, which pour down their watery stores, and deluge the country with floods, frequently laying the full-grown corn.

The storm subsided, and the day begun,
Who would not walk along the sandy way,
To smell the shower's fragrance, see the sun
With his sheer eye ascend the zenith joyous,

Mark the still-rumbling cloud crowding away
 Indignant, and embrace the gentle breeze
 That idly wantons with the dewy leaf,
 And shakes the pearly raindrop to the ground?
 How sweet the incense of reviving flow'rs!
 Ye must abroad, ye fair. The angry night
 Has done you mischief. Ev'ry plant will need
 Your kindly hand to rear its falling head.

HURDIS'S *Village Curate*.

The flowers which blossomed in the last month soon mature their seeds, and hasten to decay. A new race succeeds, which demands all the fervid rays of a solstitial sun to bring it to perfection.

The different tribes of *insects* which, for the most part, are hatched in the Spring, are now in full vigour.

What kingdoms of th' innumerable insect-kind
 On one small leaf commodious dwelling find!
 Perhaps, on this mean spot, the little pow'rs
 View rivers, hills, and fields¹; a world like ours.
 The ribs, and harder parts, present their eyes
 A ridge of mountains, that stupendous rise,
 Like those tall summits the Peruvian boasts,
 Or those that part Iberia's spreading coasts.
 Long winding streams appear their liquid veins,
 And their smooth coats a width of boundless plains.
 O, Nature! thy minutest works amaze,
 Pose the close search, and lose our thoughts in praise!

MOSES BROWNE².

Towards the middle of the month, the potato (*solanum tuberosum*), the spiked willow (*spiræa salicifolia*), jessamine (*jasminum officinale*), hyssop (*hyssopus officinalis*), the bell-flower (*campanula*), and the white lily, have their flowers full blown. The way-faring tree, or guelder rose, begins to enrich the hedges with its bright red berries, which in time turn black.

¹ See Mr. Addison on this subject, Tattler, No. 119. Spect., No. 420, and 510.

² See much curious information on the minute parts of the creation in the '*Contemplative Philosopher*,' vol. i, No. xxxi, xxxii.

Pomona now offers her fruits to allay the parching thirst; currants, gooseberries, raspberries, strawberries, cherries, and cranberries, are all peculiarly refreshing at this season.

Sometimes, however, and it is the case while we are now writing (August 1816), there is such an abundance of rain^{*}, that some of these agreeable fruits, for want of sun and dry weather, are not to be procured in any quantity till this month, and are then greatly deficient in size and flavour. During the present season (1816), we sincerely sympathised with the poet, who wrote the following sonnet

On a WET SUMMER.

All ye who far from town, in rural hall,
 Like me, were wont to dwell near pleasant field,
 Enjoying all the sunny day did yield,
 With me the change lament, in irksome thrall,
 By rains incessant held; for now no call
 From early swain invites my hand to wield
 The scythe; in parlour dim I sit concealed,
 And mark the lessening sand from hourglass fall;
 Or 'neath my window view the wistful train
 Of dripping poultry, whom the vine's broad leaves
 Shelter no more.—Mute is the mournful plain;
 Silent the swallow sits beneath the thatch,
 And vacant hind hangs pensive o'er his hatch,
 Counting the frequent drop from reeded eaves.

BAMFFYLDE.

Towards the end of the month, the flowers of the laurustinus (*viburnum tinus*), and the burdock (*arctium lappa*), begin to open; and the elecampane (*inula helenium*), the amaranth (*amaranthus caudatus*), the great water plantain (*alisma plantago*), water mint (*mentha aquatica*), and the common nightshade, have their flowers full blown.

^{*} The unprecedented state of the weather in June, July, and August, 1816, is well described in the following lines:

England! thy weather's like a modish wife,
 Thy winds and rains for ever are at strife;
 So termagant, awhile her bluster tries,
 And, when she can no longer scold,—she CRIES.

Young frogs leave their ponds, and resort to the tall grass for shelter; swallows and martins congregate previously to their departure; young partridges are found among the corn; and poultry moult. The hoary beetle (*scarabæus solstitialis*) makes its appearance; bees begin to expel and kill drones; and the flying ants quit their nests¹.

The 'busy bee' still pursues his ceaseless task of collecting his varied sweets to form the honey for his destroyer *man*, who, in a month or two, will close the labours of this industrious insect by the suffocating fumes of brimstone. Such is the usual reward of good services in this world. We need not wonder at the prevalence of *ingratitude*, when we are accustomed from our youth to contemplate such scenes as these,—and, when wanton cruelty to animals of every description is practised with impunity—sometimes with applause.

They are all—the meanest things that are
As free to live, and to enjoy that life,
As God was free to form them at the first,
Who, in his sov'reign wisdom, made them all.
Ye, therefore, who love mercy, teach your sons
To love it too.

COWPER².

¹ Of the *ant*, some interesting particulars have been given in T. T. for 1814, p. 189, and in our last volume, p. 205. Milton thus alludes to the *supposed* provident care of the emmet or ant in heaping up food for the winter:—

First crept

The parsimonious *emmet*, provident
Of future, in small room large heart inclosed;
Pattern of just equality, perhaps,
Hereafter; joined in her popular tribes
Of commonality.

² To every one, but particularly to youth, we recommend the attentive perusal of 'Three Discourses on the Care of the Animal Creation, and the Duties of Man to them, by the *Rev. James Plumptree, B.D.*,' sold by Darton and Harvey, and Baldwin, Paternoster Row.

To the BURNIE BEE.

Blithe son of Summer, furl thy filmy wings,
Alight beside me on this bank of moss;
Yet to its sides the lingering shadows cling,
And sparkling dew the dark-green tufts imboss.

Here may'st thou freely quaff the nectared sweet
That in the *violet's* purple chalice hides;
Here on the *lily* scent thy fringed feet,
Or with the *wild-thyme's* balm anoint thy sides.

Back o'er thy shoulders throw those ruby shards,
With many a tiny coal-black freckle deckt;
My watchful look thy loitering saunter guards,
My ready hand thy footsteps shall protect.

Daunted by me beneath this trembling bough,
On forked wing no *greedy swallow* sails,
No hopping *sparrow* pries for food below,
Nor ever lurks, nor dusky *blindworm* trails.

Nor shall the swarthy gaoler for thy way
His gate of twinkling threads successful strain,
With venom'd trunk thy writhing members slay,
Or from thy heart the reeking life's-blood drain.

Forego thy wheeling in the sunny air,
Thy glancing to the envious insects round;
To the dim calmness of my bow'r repair,
Silence and coolness keep its hallowed ground.

Here to the elves who sleep in flowers by day,
Thy softest hum in lulling whispers pour,
Or o'er the lovely band thy shield display,
When blue-eyed Twilight sheds her dewy shower.

So shall the fairy train by glow-worm light
With rainbow tints thy folding pennons fret;
Thy scaly breast in deeper azure dight;
Thy burnished armour speck with glossier jet.

With viewless fingers weave thy wintry tent,
And line with gossamer thy pendent cell,
Safe in the rift of some lone ruin pent,
Where ivy shelters from the *storm wind* fell.

Blest if, like thee, I cropt with heedless spoil
The gifts of youth and pleasure in their bloom,
Doomed for no coming winter's want to toil,
Fit for the spring that waits beyond the tomb.

Annual Anthology for 1799.

Grouse-shooting usually commences towards the latter end of this month. The grouse (*tetrao tetrix*) is found chiefly among the mountains in Scotland, and on the moors of Yorkshire, and in some parts of Wales. The male is two feet in length, and weighs nearly four pounds; while the female is only about half that length and weight. Their principal food is derived from the tops of heath, and the cones of the pine-tree, by which they acquire a delicate flavour, and are speedily fattened. For a full description of grouse shooting, &c. we refer to '*Fowling*,' a Poem, before quoted.

The storms of wind and rain in this month are not unfrequently accompanied by *thunder* and *lightning*; and as many serious accidents occur, particularly in the country, from not knowing how to guard against the danger arising from these phenomena of nature, we shall subjoin a few cautions on this subject from the work of an eminent physician.

When persons are overtaken by a thunder-storm, although they may not be terrified by the lightning, yet they naturally wish for shelter from the rain which usually attends it; and, therefore, if no house be at hand, generally take refuge under the nearest tree they can find. But in doing this, they unknowingly expose themselves to a *double danger*; First, because their clothes being dry, their bodies are rendered more liable to injury; for as water is a very ready conductor of electricity, the lightning often passess harmless over any substance whose surface is wet; and, Secondly, because a *tree*, or *any elevated object*, instead of warding off, serves to attract the lightning, which in its passage to the earth frequently rends the trunk and branches, and kills any animal or person that happens to be close to it at the time.

A melancholy example of this (one of many that might be quoted) took place in the Earl of Aylesford's park, at Packington, near Birmingham, in September 1789. Thomas Cawsey, of London, a farrier,

who was travelling to Birmingham, being caught in a violent thunder-storm, took shelter under a large tree in the park. The lightning soon after struck the tree, and in its passage along it to the ground, killed this unfortunate person. Lord Aylesford afterwards humanely erected a monument upon the spot, with an inscription, warning others of the great danger to which they expose themselves by taking shelter under trees during a thunder-storm.

Instead, then, of seeking protection by retiring under a tree, hay-rick, pillar, wall, or hedge, the person should either pursue his way to the nearest house, or get to a part of the road or field which has no high object to attract the lightning towards it; and remain there until the storm has subsided. It is *particularly dangerous* at such times to stand near leaden spouts, iron gates, or palisadoes; metals of all kinds having so strong an attraction for lightning, as frequently to draw it considerably out of the course which it would otherwise have taken; and it is entirely owing to this, that metallic rods and chains are useful as conductors. Excepting a house, any open space about fifty or sixty yards from a conducting body is considered as the most secure. Even within doors, there is danger of sitting near a window, fire-place, bell-wire, or under the chain of a chandelier, when the lightning approaches.

How to estimate Danger in a Thunder-Storm.—Most persons can distinguish between the noise of distant thunder, and of that which is near them: from the former having a deep, hollow, and rumbling sound, continuing for several seconds; while the latter is almost a single sharp clap, or like the discharge of a platoon of musketry immediately over-head. But there are comparatively very few who are aware, that, by attending to the interval between the flash and the report, they may accurately measure the distance of the lightning, and thereby calculate their degree of safety or of danger: for it is the lightning which does

the mischief; whilst the thunder is merely the sound occasioned by the air rushing in from all sides, to fill up the *vacuum* created by a quantity of oxygen and hydrogen gases being set on fire by the electric spark, and suddenly condensed into water, which immediately afterwards falls in rain: and the lengthened peal is the echo of the first clap, reverberated from different clouds; just as we observe the explosion of a single cannon, multiplied by surrounding hills. LIGHT moves with such prodigious velocity, that any flash which occurs within our atmosphere reaches the eye without a sensible interval; whereas SOUND moves so slowly, that we can easily calculate its progress, and consequently measure the distance of the lightning from whence it proceeded. It appears from accurate experiments, that SOUND moves through 1142 feet in a second of time, and of course through an English mile, or 5280 feet, in about four seconds and a half. If, then, from the instant the flash strikes our eyes, we can deliberately count *four* at the same rate that the pendulum of a common clock beats, we are sure that the lightning is nearly a mile distant; nor is it until the interval is *less than two seconds*, that any danger from the lightning can arise¹.

From a discovery of the ingenious Dr. FRANKLIN, it is, that we have learned how to secure houses and other more elevated buildings, and ships at sea, from

¹ Dr. Curry on Apparent Death, p. 169, *second edit.* 1814. Dr. Russell has the following pretty lines addressed to a Lady fearful of Thunder:—

Say, whence this sudden chill, my fair,
When thunder rattles through the air?
Why quits your blood each distant part,
And hastes to guard the lab'ring heart?

The flash that strikes the villain dead,
Is taught to spare the guiltless head:
Or, should by this the virtuous die,
'Twere but on lightning's wings to fly,
And gain with greater speed the sky.

damage by lightning; and are taught that a very small *metallic conductor*, if elevated above the highest part of an edifice, and connected with the earth, is capable of conveying a very large quantity of electric matter from the clouds to the earth, without noise, and leaving no signs of its having been present. An elegant modern poet, who has endeavoured to 'inlist imagination under the banner of science,' and has employed gnomes, sylphs, and nymphs for his machinery, has paid the following compliment to this philosopher for this important discovery:—

You led your FRANKLIN to your glazed retreats,
Your air-built castles and your silken seats;
Bade his bold arm invade the lowering sky,
And seize the tiptoe lightnings ere they fly;
O'er the young Sage your mystic mantle spread,
And wreathed the crown *Electric* round his head.—
Thus, when on wanton wing intrepid Love
Snatched the raised lightning from the arm of Jove;
Th' immortal sire, indulgent to his child,
Bowed his ambrosial locks, and heaven relenting smiled.

DARWIN².

The *maritime plants* which flower in July, are the club rush (*scirpus maritimus*), bearded cat's tail grass (*phleum crinitum*), bulbous fox tail grass (*alopecurus bulbosus*), the reflexed and creeping meadow grass (*poa distans & maritima*), the field eryngo (*eryngium campestre*), parsley water drop-wort (*cœnanthe pimpinelloides*), smooth sea-heath (*frankenia lævis*); and the golden dock (*rumex maritimus*); all of which are to be found in salt marshes.

On *sandy shores* may be seen the sea-mat weed (*arundo arenaria*), upright sea-lime grass (*elymus arenarius*), the sea lungwort (*pulmonaria maritima*), the sea bind-weed (*convolvulus soldanella*), saltwort (*salsola*), sea-holly (*eryngium maritimum*): prickly

² See more on the subject of *Conductors* in *Parkes's Chemical Essays*, vol. i, p. 202 et seq.

samphire (*echinophora spinosa*), and the sea-lavender (*statice limonium*), are found on maritime rocks; and the sea pea (*pisum maritimum*) on rocky shores.

About the middle or latter end of July, pilchards (*clupea pilchardus*) appear in vast shoals, off the Cornish coast; and prawns and lobsters are taken in this month. *Prawns* are found in the greatest abundance among sea-weed, and in the vicinity of rocks, at a little distance from the shore. They seldom enter the mouths of rivers, but, on the contrary, they have been caught on the surface of the sea, over thirty fathoms depth of water. Their usual mode of swimming is on their backs; but when threatened with danger, they throw themselves on one side, and spring backward to very considerable distances. They feed upon all the smaller kinds of marine animals, which they seize and devour with great voracity. In their turn they become the prey of numerous species of fish. The manner of taking prawns and lobsters has already been described in our last volume, p. 213. The *shrimp*, which is not so much esteemed as the prawn, frequents sandy sea shores in great abundance, and not unfrequently enters harbours, and even the ditches and ponds of salt marshes.

The method of *pegging* the *lobster* and crab is by driving a sharp wooden wedge between the joints of the claws, thus piercing a thin horny substance, by which operation they are wholly incapacitated from making use of those offensive weapons with which nature has armed them, being otherwise so strong and sharp, as to be capable of severing the finger of a man. These fish must undoubtedly suffer the greatest agony from pegging, as their struggles sufficiently indicate; and, on pulling out the peg previous to the boiling of the animal, a thin bloody water always follows from the wound in considerable quantities. But the lobster and crab are doomed to suffer the greatest torments; they are first *pegged*, and then *boiled alive*.

The *farmer's* labours in this month are various and important. In the southern parts of the island the corn harvest commences; but August is, generally, dedicated to this grateful employment; though, in some districts, the work of the sickle is protracted till September or even October. The hay-harvest in the north is generally completed in July. Flax and hemp are pulled in this month.

We close this month's lucubrations with a charming 'Elegy' by John Scott, of Amwell, an author who abounds in original and beautiful thoughts, expressed in the genuine language of poetry. Though included in some of the great collections of English poets, his works are not sufficiently known; they cannot, indeed, be too much admired for their delicacy of sentiment and excellent moral tendency.

Written in the HOT WEATHER, July 1757.

Three hours from noon the passing shadow shows

The sultry breeze glides faintly o'er the plains,

The dazzling ether fierce and fiercer glows,

And human nature scarce its rage sustains.

Now still and vacant is the dusty street,

And still and vacant all yon fields extend,

Save where those swains, oppressed with toil and heat,

The grassy harvest of the mead attend.

Lost is the lively aspect of the ground,

Low are the springs, the reedy ditches dry;

No verdant spot in all the vale is found,

Save what yon stream's unfailing stores supply.

Where are the flowers, the garden's rich array?

Where is their beauty, where their fragrance fled?

Their stems relax, fast fall their leaves away,

They fade and mingle with their dusty bed:

All but the natives of the torrid zone,

What Afric's wilds or Peru's fields display,

Pleased with a clime that imitates their own,

They lovelier bloom beneath the parching ray.

Where is wild Nature's heart-reviving song,

That filled in genial spring the verdant bow'rs?

Silent in gloomy woods the feathered throng

Pine through this long, long course of sultry hours.

Where is the dream of bliss by Summer brought?
 The walk along the rivulet-watered vale?
 The field with verdure clad, with fragrance fraught?
 The sun mild-beaming, and the fanning gale?

The weary soul Imagination cheers,
 Her pleasing colours paint the future gay:
 Time passes on, the truth itself appears,
 The pleasing colours instant fade away.

In different seasons different joys we place,
 And these will Spring supply, and Summer these;
 Yet frequent storms the bloom of Spring deface,
 And Summer scarcely brings a day to please.

O for some secret shady cool recess,
 Some Gothic dome o'erhung with darksome trees,
 Where thick damp walls this raging heat repress,
 Where the long aisle invites the lazy breeze!

But why these plaints?—reflect, nor murmur more—
 Far worse their fate in many a foreign land,
 The Indian tribes on Darien's swampy shore,
 The Arabs wandering over Mecca's sand.

Far worse, alas! the feeling mind sustains,
 Racked with the poignant pangs of fear or shame;
 The hopeless lover bound in Beauty's chains,
 The bard whom Envy robs of hard-earned fame:

He, who a father or a mother mourns,
 Or lovely consort lost in early bloom;
 He, whom fell Febris, rapid Fury! burns,
 Or Phthisis slow leads lingering to the tomb—

Lest Man should sink beneath the present pain;
 Lest Man should triumph in the present joy;
 For him th' unvarying laws of Heaven ordain,
 Hope in his ills, and to his bliss alloy.

Fierce and oppressive is the heat we bear,
 Yet not unuseful to our humid soil;
 Thence shall our fruits a richer flavour share,
 Thence shall our plains with riper harvests smile.

Reflect, nor murmur more—for, good in all,
 Heaven gives the due degrees of drought or rain;
 Perhaps ere morn refreshing showers may fall,
 Nor soon yon sun-rise blazing fierce again.

Ev'n now behold the grateful change at hand!
 Hark, in the East loud blustering gales arise;
 Wide and more wide the darkening clouds expand,
 And distant lightnings flash along the skies!

O, in the awful concert of the storm,
 While hail and rain and wind and thunder join;
 May deep-felt gratitude my soul inform,
 May joyful songs of reverent praise be mine!

AUGUST.

SEXTILIS was the antient Roman name of this month, being the sixth from March. The Emperor Augustus changed this name, and gave it his own, because in this month Cæsar Augustus took possession of his first consulship, celebrated three triumphs, reduced Egypt under the power of the Roman people, and put an end to all civil wars. 'The Saxons called August *arn-monat* (more rightly *barn-monat*), intending thereby the then filling of their barns with corn.'

Remarkable Days.

1.—LAMMAS DAY.

THE name of this day is probably derived from an old Saxon term, signifying *Loaf-Mass*; as it was customary for the Saxons to offer an oblation of loaves, made of new wheat, on this day, as the first-fruits of their new corn.

*2. 1100.—HENRY I BEGAN TO REIGN.

Henry was of a middle stature, and robust make, with dark brown hair, and blue serene eyes. He was facetious, fluent, and affable to his favourites. His capacity, naturally good, was improved and cultivated in such a manner, that he acquired the name of *Beau Clerc* by his learning. He was cool, cautious, politic, and penetrating; his courage was unquestioned, and his fortitude invincible. He was vindictive, cruel, and implacable, inexorable to offenders, rigid and se-

vere in the execution of justice. His Norman descent and connexions with the continent inspired him with a contempt for the English, whom he oppressed in the most tyrannical manner.—*Smollett*.

*3. 1770.—FREDERICK WILLIAM IV, KING OF PRUSSIA, BORN.

6.—TRANSFIGURATION.

*6. 1637.—BEN JONSON DIED.

To my BOOKSELLER.

Thou that mak'st *gain* thy end, and, wisely well,
 Call'st a *book good*, or *bad*, as it doth *sell*,
 Use mine so too: I give thee leave; but crave
 For the luck's sake it thus much favour have,
 To lie upon thy stall, till it be sought;
 Not offered, as it made suit to be bought;
 Nor have my title-leaf on posts, or walls,
 Or in cleft sticks, advanced to make calls
 For termers, or some clerk-like serving man,
 Who scarce can spell th' hard names—whose knight less can.
 If, without these vile arts, it will not sell,
 Send it to Bucklersbury, there 'twill well. JONSON.

7.—NAME OF JESUS.

Before the Reformation, this day was dedicated to *Afra*, a woman who had been converted to Christianity by Narcissus, Bishop of Jerusalem, and who afterwards suffered martyrdom; and the Breviary was recognized by Paul V. Afterwards Donatus, who became martyr in the time of Julian, for refusing to sacrifice, was substituted in her place. Our reformers devoted it to the NAME OF OUR BLESSED LORD.

*9. 1783.—PELEW ISLES DISCOVERED.

10.—SAINT LAWRENCE.

St. Lawrence was, by birth, a Spaniard, and treasurer of the Church of Rome, being deacon to Pope Sextus, about the year 259. He was laid upon a gridiron, and broiled over a fire.

12. 1762.—H. R. H. PRINCE REGENT BORN.

***13. 1704.—BATTLE OF BLENHEIM.**

With fire and sword, the country round
 Was wasted far and wide,
 And many a childing mother then,
 And new-born infant died.
 But things like that, you know, must be
 At every famous victory.

They say it was a shocking sight
 After the field was won,
 For many thousand bodies here
 Lay rotting in the sun;
 But things like that, you know, must be
 After a famous victory. SOUTHEY.

14. 1742.—POPE PIUS VII BORN.*15.—ASSUMPTION.**

This is a festival in the Greek and Romish churches, in honour of the supposed miraculous ascension of the Virgin Mary into heaven.

15. 1769.—NAPOLEON BONAPARTE BORN.**16. 1678.—ANDREW MARVELL DIED.**

Climb at court for me that will,
 Tottering favour's pinnacle,
 All I wish is to lie still.
 Settled in some secret nest,
 In calm quiet let me rest;
 And, far off the public stage,
 Pass away my silent age.
 Thus, when, without noise, unknown,
 I have lived out all my span,
 I shall die without a groan,
 A plain honest countryman.
 Who, exposed to others' eyes,
 Into his own heart ne'er pries,
 Death's to him a strange surprise. MARVELL.

***19. 1815.—COLONEL LABEDOYERE SHOT.**

Two hours and a half after sentence had been passed upon him, he was hurried off to the plain of Grenelle, where two lines of *gendarmes* were drawn up to carry the sentence into effect. He refused to

have his eyes bandaged, and, taking off his hat, said to the soldiers, '*Surtout ne me manquez pas—tirez.*' They fired,—and in an instant he was no more.

24.—SAINT BARTHOLOMEW.

He preached the Gospel in Armenia, converted the Lycaonians, and afterwards visited India.

The Dissenters observe the 24th of August as the day on which the Nonconformist Ministers were ejected from their livings, and appeal to the Nonconformists' Memorial as a testimony of their wrongs. But the Church also has her memorials to produce in Walker's Sufferings of the Clergy during the Usurpation. On both sides, no doubt, many suffered unjustly; and happy is it, that we live in times when we can think and say so.

*25. 1770.—CHATTERTON DIED.

O! GENIUS, art thou to be envied or pitied? Doomed to form expectations the most sanguine, and to meet with disappointments the most mortifying? To indulge towards others the most generous wishes, to receive thyself the most illiberal treatment? To be applauded, admired, and *neglected*? To be a friend to all, befriended often by none? O! thou creative, discriminating power, source of inexpressible delights, and nurse of unknown sensibilities, that perpetuate distress; Fancy shall embody thy form, and often visit the grave of *Chatterton*, to drop the tear of sympathy over that ingenious, unfriended, and unfortunate youth!—*Dyer*.

*27. 1748.—THOMSON DIED.

Ah! what avails the largest gifts of heaven,
When drooping health and spirits go amiss?
How tasteless then whatever can be given!
Health is the vital principle of bliss,
And exercise of health. In proof of this,
Behold the wretch who slugs his life away
Soon swallowed in Disease's sad abyss,

While he whom Toil has braced, or manly play,
As light as air each limb, each thought as clear as day.

O who can speak the vigorous joys of health !
Unclogged the body, unobscured the mind ;
The morning rises gay, with pleasing stealth,
The temperate evening falls serene and kind.
In health the wiser brutes true gladness find.
See ! how the younglings frisk along the meads,
As May comes on, and wakes the balmy wind ;
Rampant with life, their joy all joy exceeds ;
Yet what but high-strung health this dancing pleasure breeds ?
Castle of Indolence.

28.—SAINT AUGUSTINE.

Augustine was born at Thagaste, a town in Numidia, in the year 354. He was a judicious divine, and the most voluminous writer of all the Fathers. He died in 430, at the age of 77.

29.—JOHN BAPTIST BEHEADED.

This day was formerly denominated *Festum Collectionis Sancti Johannis Baptistæ* ; or, the feast of gathering up St. John the Baptist's relics ; but afterwards, by corruption, *Festum Decollationis*, the festival in remembrance of his being beheaded. His nativity is celebrated on the 24th of June, which see.

*31. 1422.—HENRY VI BEGAN TO REIGN.

He was chaste, pious, compassionate, and charitable ; and so inoffensive, that the bishop, who was his confessor for ten years, declares, that in all that time he had never committed any sin that required penance or rebuke. In a word, he would have adorned a cloister, though he disgraced a crown ; and was rather respectable for those vices he wanted, than for those virtues he possessed. He founded the colleges of Eton and Windsor, and King's College in Cambridge, for the reception of those scholars who had begun their studies at Eton.—*Smollett*.

Astronomical Occurrences

In AUGUST 1817.

The Sun enters Virgo at 28 m. past 10 in the morning of the 23d of this month, and the days then begin to decrease with greater rapidity than they have done since the Sun entered Cancer; as will appear evident from the following

TABLE

Of the Sun's Rising and Setting for every fifth Day of the Month.

Friday,	Aug. 1st,	Sun rises 20 m. after 4.	Sets 40 m. after 7
Wednesday,	— 6th,	. . . 28 . . . 4 . . . 32 . . . 7	
Monday,	— 11th,	. . . 36 . . . 4 . . . 24 . . . 7	
Saturday,	— 16th,	. . . 45 . . . 4 . . . 15 . . . 7	
Thursday,	— 21st,	. . . 54 . . . 4 . . . 6 . . . 7	
Tuesday,	— 26th,	. . . 2 . . . 5 . . . 58 . . . 6	
Sunday,	— 31st,	. . . 12 . . . 5 . . . 48 . . . 6	

The Equation of Time, or quantity to be added to the time marked by a good sun-dial, also decreases from the beginning of the month, till it become nothing at the end of it; as appears from the following Table. From that time it increases till it attain its annual maximum, on the 3d of November, when it is 16 m. 16.1 s.

TABLE

For every fifth Day of the Month.

		m.	s.
August	1st; to the time by the dial	add 5	57
	6th,	. . . . . 5	33
	11th,	. . . . . 4	54
	16th,	. . . . . 4	2
	21st,	. . . . . 2	56
	26th,	. . . . . 1	38
	31st,	. . . . . 0	10

The Moon commences her last quarter at 51 m.

past 2 in the morning of the 5th of August. The change takes place at 7 in the morning of the 13th. She enters her first quarter at 50 m. after 4 in the afternoon of the 19th; and she is full at 36 m. past 7 in the evening of the 26th. The Moon may likewise be seen to pass the meridian at the following times in the course of the present month.

August 22d, at 40 m. after 8 in the evening

23d, . 39	9
24th, . 36	10
25th, . 28	11

The Moon and Mars will be in conjunction at 58 m. past 9 on the evening of the 5th; and she will also be in conjunction with the star α in Libra at 27 m. past 6 in the evening of the 18th.

Mercury will be in conjunction with the star marked α in Leo on the 10th, when the star will be 68' south of the planet. Jupiter and the star marked β in Scorpio will also be in conjunction on the 10th; and the star will then be $23\frac{1}{2}$ north of the planet. Mercury will be in his superior conjunction at $\frac{1}{4}$ past 2 in the morning of the 2d. Jupiter will be in quadrature at $\frac{1}{4}$ past 5 on the evening of the 25th. Saturn will be in opposition at 8 in the morning of the 26th; and Mars will be in quadrature at 30 m. after midnight of the 28th.

There will only be one eclipse of Jupiter's satellites visible this month. The first satellite will be eclipsed on the 12th; and the emersion will take place at 31 m. after 8 in the evening.

ON THE CALCULATION OF ECLIPSES.

AMONG the various phenomena of the heavens there are none which have awakened so much curiosity, excited such interest, or caused such universal terror, as eclipses; nor are there any of the calculations of the astronomer which has excited so much astonishment in the minds of the unlearned in all

ages, as those by which he is enabled to predict them with such undeviating accuracy.

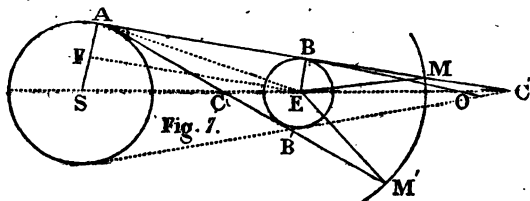
In treating of eclipses, the observations may be conveniently arranged under three distinct heads: a description of the general phenomena which they present; a determination of the circumstances under which they can take place; and the method of predicting them. On the first of these heads we have already treated in the popular view of eclipses given in our former volumes; viz. vol. i, p. 181; and vol. ii, p. 179 and seq. We have also indicated our intention (T.T. 1815, p. 227) to explain the other two; and shall now endeavour to redeem that pledge.

The first subjects which present themselves to be determined in this research, are the lengths of the conical shadows projected behind the Earth and the Moon, in order to ascertain whether the former extends to the orbit of the Moon, and the latter to that of the Earth.

On the Lengths of the Shadows projected by the Earth and Moon.

To render this inquiry as simple as possible, it will be necessary to consider the Earth as a spherical body, and not to take into the account the slight effects of its atmosphere.

Upon these principles, let S (in the following fig. 7) be the centre of the Sun, E that of the Earth,



AB a right line forming a tangent to the Earth and the Sun, and which forms the limit of the real sha-

dow. SE will be the axis of the conical shadow, and EC the length it is required to determine. This can be done when the angle ECB, at the vertex of the cone, is known. Now, by the principles of geometry, this angle is easily found to be equal to the semidiameter of the Sun minus his horizontal parallax, which has been stated, in the preceding article on that subject, to be equal to $8''.78$, for the Earth's mean distance from the Sun¹. From this it is easy to find the length of the shadow CE; for in the triangle CBE right angled at B, the angle C and the side EB, which is the radius of the Earth, are both known;

and, therefore, as $\sin C : \text{rad. } (1) :: r : \frac{r}{\sin C} =$

CE, where r denotes the radius BE of the Earth. If we put D for the apparent diameter of the Sun, and p for his horizontal parallax, we shall have, from

what is above stated, $CE = \frac{r}{\sin (\frac{1}{2}D - p)}$. From

this it is evident, both from an inspection of the figure and the nature of the preceding formula, that the value of CE, the length of the conical shadow, must vary with the apparent diameter of the Sun, and consequently with his distance from the Earth, being greatest when his distance is greatest, and the contrary.

Now the apparent diameter of the Sun is, when

In perigee	1955".567
At his mean distance	1922.713
In apogee	1890.960

¹ Draw FE parallel to CB, and put the angle ECB = SEE = c : then we shall have the $\sin c = \frac{SP}{SE} = \frac{SA - EB}{SE} = \sin \frac{D}{2} -$

$\sin p$, where D is the apparent diameter of the Sun, and p its horizontal parallax. Then, since the arcs are so small, they may be substituted for their sines without sensible error, and we have $c = \frac{1}{2}D - p$, as above stated.

The parallax of the Sun is,

In perigee	8".942
At his mean distance . . .	8.780
In apogee	8.618

And, therefore, the half of the former numbers, diminished by the latter, as above stated, gives for the divisors, when the Sun is

In perigee	968".843
At his mean distance . . .	952.576
In apogee	936.862

Consequently, by reducing these seconds into minutes, and dividing the radius of the Earth by the sine of each number respectively, we shall obtain the length of the shadow in terms of the terrestrial radius. The following are the results of these operations; viz. when the Sun is

In perigee	212.896
At his mean distance . . .	216.531
In apogee	220.238

The relation of these numbers shows that the length of the shadow increases as the distance of the Earth from the Sun augments. The greatest distance of the Moon from the Earth, as shown in the preceding article, is only 63.94145 terrestrial radii, and which is, therefore, much less than the least of the preceding numbers; and, consequently, if the Moon moved always in the plane of the ecliptic, she would pass through the Earth's shadow in each of her revolutions.

The length of the conical shadow, projected behind the Moon, may also be calculated in a similar manner, supposing her to be a spherical body, the apparent diameter of which is known. For this purpose the relative values of the Sun's apparent diameter and parallax, as they would appear at the surface of the Moon, must be employed; and these may be readily deduced from those quantities at the surface of the Earth, and which have been used in the preceding

calculations. As the Moon is supposed to be in conjunction at the time the length of her shadow is required, the apparent diameter of the Sun, as seen from her surface, will be equal to the diameter of the same body seen from the Earth increased in the inverse ratio of the distances of the Earth and the Moon from the Sun at that time. In the same manner, the parallax of the Sun for the Moon is equal to the parallax of the Sun for the Earth augmented in the same ratio, and diminished in the ratio of the lunar and terrestrial radii.

According to these principles, if the distance of the Earth from the Sun be denoted by D , that of the Moon from the same body by D' ; the apparent diameter of the Sun as seen at the Earth by d , and the same as seen at the Moon by d' , we shall have

$$D' : D :: d : d' = \frac{Dd}{D'};$$

and by substituting the respective values of these letters, as already given, in this formula, the following values of d' will be obtained.

Sun in perigee	{ Perigee . . .	1960".3172
Moon in . . .	Mean distance .	1960 .6541
	Apogee . . .	1960 .9920
Sun at mean dist.	{ Perigee . . .	1927 .2944
Moon in . . .	Mean distance .	1927 .8200
	Apogee . . .	1928 .3893
Sun in apogee	{ Perigee . . .	1895 .3530
Moon in . . .	Mean distance .	1895 .6410
	Apogee . . .	1895 .9552

Now, in order to find the reduced parallax, let p and p' denote the horizontal solar parallax at the surface of the Earth and the Moon respectively; and R and r the terrestrial and lunar radii; then we shall have

$$D' : D :: p : \frac{pD}{D'},$$

which expresses the solar parallax augmented in proportion to the diminution of the distance : and again, for the effect of the difference of the radii of the Earth and the Moon,

$$R : r :: \frac{pD}{D'} : p' = \frac{rpD}{RD'}.$$

Now, as the ratio between the terrestrial and lunar radii is constant, and $\frac{r}{R} = 0.27293$; if this be substituted for $\frac{r}{R}$ in the above formula, we shall obtain

$$p' = \frac{0.27293pD}{D'}.$$

Then by substituting the respective values of the other letters, as found in this and the preceding articles, in this last formula, the parallaxes corresponding to the apparent diameters above found, under the same circumstances, will be easily obtained.

Having obtained these reduced values of the apparent diameter of the Sun and his parallax at the surface of the Moon, the same formula we have given for calculating the length of the Earth's shadow will serve equally for determining that projected by the Moon. The two following results have been thus calculated, and refer to the two extremes, in which the length of the conical shadow is the greatest and least, in comparison with the distance of the Earth.

When the Sun is in apogee, and the parallax the greatest, the length of the conical shadow projected by the Moon is 59.73 terrestrial radii ; and her distance from the Earth 55.902 radii.

The Sun being in perigee, and the parallax the least, the length of the shadow is 57.76, and the distance of the Moon 63.862 radii.

In the first of these cases, the shadow of the Moon extends beyond the Earth, and, in the other, it evidently falls short of it. Hence, when the Moon is in the plane of the ecliptic at the time of

her conjunction, she will not always produce a total eclipse of the Sun: sometimes only a part of the Sun's surface is hid, and, at others, no eclipse at all can take place, in consequence of the shadow not reaching the Earth.

[To be continued next Month.]

The Naturalist's Diary.

Farewel the pleasant violet-scented shade,
The primrosed hill, and daisy-mantled mead;
The furrowed land, with springing corn arrayed;
The sunny wall, with bloomy branches spread:

Farewel the bower with blushing roses gay;
Farewel the fragrant trefoil-purpled field;
Farewel the walk through rows of new-mown hay,
When ev'ning breezes mingled odours yield:

Of these no more—now round the lonely farms,
Where jocund Plenty deigns to fix her seat,
Th' autumnal landscape op'ning all its charms,
Declares kind Nature's annual work complete.

JOHN SCOTT.

THE powerful influence of the solar rays now contributes to ripen the various sorts of grain, which are benevolently given for the food of man and cattle. Fine weather is very desirable, that the principal source of the farmer's wealth may be safely housed; for sudden storms beat down the nearly ripe corn, and materially injure it. The time of commencing the harvest varies greatly in different districts. It is usually begun in the southern and midland parts of the kingdom towards the end of *July*, but principally at the beginning of this month; in the northern districts of *Scotland*, the harvest does not commence until the first or second week in *September*. And, it is but rarely that, in these parts of *England*, it is finished, even in the most favourable situations, before the end of *October*; and, not unfrequently, this time is protracted till the middle of *November*, till the corn has been ripened by the frost. At *Inverary*, the seat of the Duke of Argyle in *Scotland*,

the corn is so often spoiled by the rain, that the duke has built an immense barn, with a draft of air through it, and pins to hang his wheat on to dry it.

The manner of taking the harvest is not more various than the periods at which it begins. In some cases, it is the custom to reap or cut the corn with a sickle, and bind it up into sheaves of a moderate size; in others, the cutting of the grain is executed by the *scythe* in some particular method, and often left, without being bound up, or bound into a sort of bundles. A toothed sickle is employed by some farmers; while others use a sickle with a cutting edge. The grain, when reaped or mown, is, in some counties, set up into a sort of *hattock*, and capped or covered with sheaves of the same; but, in others, the practice is widely different. Some cut the grain high, so as to leave a rough stubble; while others cut it quite close to the land. In Surrey and Kent, *women* may be seen wielding the sickle. Rye and oats usually become ripe first; but this depends upon the time of sowing, though grain of every species may, sometimes, be seen at once fit for the sickle.

The utmost diligence is now exerted, and labourers from all parts are eagerly engaged to give their assistance in this delightful occupation: all is bustle and activity.

In diff'rent parts what diff'rent views delight,
Where on neat ridges waves the *golden grain*;
Or where the bearded *barley*, dazzling white,
Spreads o'er the steepy slope or wide champaign.

The smile of Morning gleams along the hills,
And wakeful Labour calls her sons abroad;
They leave with cheerful look their lowly vills,
And bid the fields resign their ripened load.

In various tasks engage the rustic bands,
And here the *scythe*, and there the *sickle* wield;
Or rear the *new-bound sheaves* along the lands,
Or range in heaps the swarths upon the field.

Some build the *shocks*, some load the spacious wains,
 Some lead to shel't'ring barns the fragrant corn;
 Some form *tall ricks*, that, tow'ring o'er the plains
 For many a mile, the homestead yards adorn.—
 The rattling *car* with verdant branches crowned,
 The joyful swains that raise the clam'rous song,
 Th' enclosure gates thrown open all around,
 The *stubble* peopled by the gleaning throng,
 Soon mark glad harvest o'er.—Ye rural lords,
 Whose wide domains o'er Albion's isle extend;
 Think whose kind hand your annual wealth affords,
 And bid to HEAVEN your grateful praise ascend!

JOHN SCOTT.

The labours of the sickle completed, those who have toiled in securing the wealth of their employer, now receive the welcome reward of a harvest-supper or festival.

Here once a year distinction lowers its crest,
 The master, servant, and the merry guest,
 Are equal, all; and round the happy ring
 The *reaper's* eyes exulting glances fling,
 And warmed with gratitude he quits his place,
 With sunburnt hands, and ale-enlivened face,
 Refills the jug his honoured host to tend,
 To serve at once the *master* and the *friend*;
 Proud thus to meet his smiles, to share his tale,
 His nuts, his conversation, and his ale.

BLOOMFIELD.

Luxury and refinement, however, have, we fear, of late years, contributed almost entirely to divide the labourer from his employer; and the poet sings of 'days long past.'

The *separate* table and the costly bowl are but too common at the close of harvest in many parts of England. 'It is devoutly to be wished' (observes a useful writer), 'that the farmer, the gentleman, and the clergyman, would ever keep in mind, that *personal intercourse*, at times, with their inferiors, upon free but not too familiar a footing, tempered with cheerful and innocent mirth, is not only a *duty*, but their *interest*, and would tend to attach the labourer to his master, and

be one great means of civilizing and purifying society.' We should do well to take a lesson from our continental neighbours in this respect, as their excellent treatment of domestic servants insures the highest fidelity and most inflexible honesty. May the description of the poet again become universal in its application !

Labour and mirth united, glow beneath
The mid-day sun: the laughing hinds rejoice :
Their master's heart is opened, and his eye
Looks with indulgence on the gleaning poor,
At length adorned with boughs and garlands gay,
Nods the last load along the shouting field.
Now to the God of harvest in a song
The grateful farmer pays accepted thanks,
With joy unfeigned ; while to his ravished ear
The gratulations of assisting swains
Are music. His exulting soul expands :
He presses every aiding hand ; he bids
The plenteous feast, beneath some spreading tree,
Load the large board ; and circulates the bowl,
The capious bowl, unmeasured, unrestrained¹.

About the 11th of August, the puffin (*alca arctica*) migrates. Priestholme, or Puffin's Island, about three quarters of a mile from the Isle of Anglesea, abounds with these birds ; and their flocks, for multitude, may be compared to swarms of bees.

About the middle of the month, the swift disappears, and probably migrates to more southern regions. Rooks begin to roost in their nest trees, and young broods of goldfinches (*fringilla carduelis*) appear ; lapwings (*tringa vanellus*) and linnets (*fringilla linota*) congregate ; the nuthatch chatters ; and, towards the end of the month, the redbreast is again heard.

At the beginning of the month, melilot (*trifolium officinale*), rue (*ruta graveolens*), the water parsnip

¹ Dodsley's 'Agriculture,' a Poem. The reader may peruse also the remaining stanzas of Mr. John Scott's Elegy 'written in Harvest,' just quoted.

(*sysimbrium nasturtium*), horehound (*marrubium vulgare*), water-mint (*mentha aquatica*), the orpine (*sedum telephium*), and the *gentiana amarella*, have their flowers full blown. The purple blossoms of the meadow saffron (*colchicum autumnale*) now adorn the low moist lands. The number of plants in flower, however, is greatly lessened in August, those which bloomed in the former months running fast to seed. The queen of flowers is no more; we now take leave of this beauty, in the following lines of Waller :—

Go, lovely Rose,
 Tell her that wastes her time and me,
 That now she knows,
 When I resemble her to thee,
 How sweet and fair she seems to be.
 Tell her that's young,
 And shuns to have her graces spied,
 That hadst thou sprung
 In desarts, where no men abide,
 Thou must have uncommended died.
 Small is the worth
 Of Beauty from the light retired;
 Bid her come forth,
 Suffer herself to be desired,
 And not blush so to be admired.
 Then die, that she,
 The common fate of all things rare,
 May read in thee,—
 How small a part of time they share
 That are so wondrous sweet and fair¹.

¹ *Emil.* Of all flowers
 Methinks the *rose* is best.

Serv. Why, gentle madam?

Emil. It is the very emblem of a maid:
 For when the west wind courts her gently,
 How modestly she blows, and paints the Sun
 With her chaste blushes! When the north comes near her,
 Rude and impatient, then, like chastity,
 She locks her beauties in her bud again,
 And leaves him to base briars.

BEAUMONT AND FLETCHER.

The scarcity of flowers, however, is amply repaid by an abundance of fruits of various kinds and hues :—

The mealy *plum*

Hangs purpling, or displays an amber hue;
The luscious *fig*, the tempting *pear*, the *vine*,
Perchance, that in the noontide eye of light
Basks glad in rich festoons. The downy *peach*
Blushing like youthful cheeks; the *nectarine* full
Of lavish juice.—

BIDLAKE.

Heaths and commons are now in all their beauty; the flowers of the various species of heath (*erica*) covering them with a fine purple hue. Ferns also begin to flower, the commonest sort of which is the fern or brakes (*polypodium filix-mas*); but the female (*pteris aquilina*) is the most beautiful plant.

Insects still continue to swarm; they sport in the sun from flower to flower, from fruit to fruit, and subsist themselves upon the superfluities of nature. The *bee* continues his labours.

From the SPANISH of MELENDEZ.

O'er yonder vale, industrious *bee*,
No longer range on busy wing;
Nor for your golden treasure spoil
The blooming children of the spring;

No more, when o'er the smiling world
The sun his early radiance throws,
Extract the pearly tears of morn
That fill the calyx of the rose:

Let the soft *lily's* virgin pride
To dread your pilf'ring kisses cease,
And let the whiter *orange-flow'r*
Breathe its ambrosial sweets in peace.

And let the blushing *pink* unspoiled
Guard for the fair its rich perfume,
That beauty's breast may show more white
Contrasted with the living bloom.

But on my *Laura's* budding lips
Alight with murmurs soft and still;
Ah! there your restless wing compose,
And rob their luscious sweets at will.

It is not the air only that abounds with insects at this season ; ditches and stagnant pools of water are equally prolific of them. One of those most commonly found in these haunts, is the *monoculus apus* ; and, as it is an excellent subject for the microscope, we shall give our readers some account of an examination of one by the aid of this powerful instrument.

This insect is about the size of a flea, and appears, when examined by the microscope, to be covered with a firm crustaceous skin, which opens under the belly of the animal, in the manner of a bivalve shell. This skin or shell, if it may be so called, is of a greenish colour, and full of indentures, which form very beautiful reticulations. It is so transparent, that the eggs which, when excluded, are carried on the back of the female till the young are produced, as well as the legs, body, and intestinal motion, plainly appear. This insect, to the sight unassisted by the microscope, appears to have but one eye, whence the genus *monoculus* receives its name. However the fact is, on account of the smallness of the head, both eyes seem united, being situated in the very middle of the forehead. Each eye is composed of a number of smaller ones, which appear like smooth, bright, hemispheric dots. It is worthy of remark, that the external motion of the eye, which insects generally want, is found in the utmost perfection in this creature. Each eye turns, as it were, on its own centre, which motion is produced by an elegant collection of muscles, that proceed from each eye like cords from a pulley. The skin which covers the head is so pellucid, that these muscles, with their contraction and lengthening, may at any time be seen with a first or second magnifier, and well-adapted light. The formation of this insect's branching fore-legs is very curious : by the help of these and the other legs that are under the shell, its motions are performed in the water with great velocity.

The young of this insect are endowed with a very

nimble motion, and, except in colour, suffer no future change; only continuing to grow larger and browner as they advance in age. This insect affords the most beautiful view imaginable of the pulsation of the heart. The method of examining it to advantage, is to place the insect on one side, in a very small drop of water: in this situation the heart may be seen performing its dilatations and contractions with the utmost regularity. Besides the *monoculus opus*, we have four or five more species of the same genus in England. The *monoculus pulex* is very small, and usually of a greenish, sometimes of a reddish, colour; the *monoculus quadricornis* is of a brownish colour: the tail is long, slender, and bifid, and under this, on each side, there is frequently seen a large cluster of eggs, equal to the whole body of the insect in bigness. The shell with which the body of the *monoculus conchaceus* is covered, is of an oblong, ovated figure, and of a dusky brown colour: when taken out of the water, it shuts up close, and resembles the seed of some plant. A species of this genus, which is of a blood-red colour, commonly called, after Swammerdam, the *pulex aquaticus arborescens*, is so numerous in stagnant waters, at some times, as totally to change their colour; and this has been called *turning water into blood*, and by many fanciful people esteemed a portent.

Some of the most splendid butterflies are seen in August. The most remarkable are the swallow-tailed butterfly (*papilio machaon*), of a beautiful yellow, with black spots; the peacock butterfly (*papilio io*), of an orange-brown colour, with black bars intersected by spaces of yellow; the admirable butterfly (*papilio atalanta*), of the most intense velvet-black colour, with a rich carmine-coloured bar across the upper wings, which are spotted towards the tips with white; and the *papilio paphia*, a highly elegant insect of a fine orange-chesnut colour above, with numerous black spots and bars; it is usually found in

the neighbourhood of woods. To these may be added, the black-eyed marble butterfly (*papilio semele*), and the small golden black spotted butterfly (*papilio phlæas*).

Now to the *pool*, or to the shallow *brook* ¹,
 The *panting herds retire*, beneath the shade
 Of quivering verdure, where inert they stand ;
 Or only lash from off their shining sides
 The flies ; while the *docked horse*, deprived of aid
 That nature lends, unguarded feels the sting
 Of madding torment, and with anguish foams.

BIDLAKE.

That beautiful little insect, the *lady-bird*, or lady-cow, now seen, and so often charged with being the cause of blights in apple-trees, is in reality the best remedy against that disease. The lady-bird, both when perfect and in its larva state, feeds entirely upon the *aphis*, a genus of which the blight in question is a species. The utility of this insect, in destroying the blight, is well known in the hop-countries.

The harvest-bug (*acarus ricinus*), in this and the following month, proves a very troublesome and disagreeable insect ; particularly in some of the southern counties of England. It is of a somewhat globular

¹ The failure of the *brooks* in summer is beautifully alluded to by Bishop Horne. Speaking of the comforts of the world, riches, fame, honour, and pleasure, he says, ' In such comforters, therefore, put not your trust, for they will undoubtedly fail you in time of need. They are *winter-brooks*, overflowing when there is least occasion ; but, in the *burning heat of summer*, the thirsty traveller, who has recourse to them for the relief of his necessity, finds them dry.'—See his sermon entitled *The Holy Ghost a Comforter*. COWPER, in his 'Task,' thus characterises the summer brook :—

The declivity is sharp and short,
 And such the re-ascent ; between them weeps
 A little *naiad* her *impov'rish'd urn*
All summer long, which winter fills again.

shape, of a bright red colour; smaller than the common mite, and but just perceptible when on the skin. It adheres to the skin by means of two short arms, situated above the upper legs, so firmly as not easily to be disengaged. Wherever it fixes, it causes a tumour about the size of a pea, or larger, accompanied by a most unpleasant irritation. These insects abound upon plants, and are generally caught from walking in gardens, among long grass, or in corn fields. The best cure for the bites is hartshorn. Flies are now numerous, and *wasps* become in this, and the subsequent month, very annoying to us in our rural walks.

To a WASP.

Winged wand'rer of the sky!
 Inhabitant of Heav'n high!
 Dreadful with thy dragon tail,
 Hydra-head, and coat of mail!
 Why dost thou my peace molest?
 Why dost thou disturb my rest?
 When in May the meads are seen,
 Sweet enamel, white and green!
 And the gardens, and the bow'rs,
 And the forests, and the flow'rs,
 Don their robes of curious dye,
 Fine confusion to the eye!
 Did I—chase thee in thy flight?
 Did I—put thee in a fright?
 Did I—spoil thy treasure hid?
 Never—never—never did.
 Eavious nothing, pray beware;
 Tempt mine anger, if you dare.
 Trust not in thy strength of wing;
 Trust not in thy length of sting.
 Heav'n nor earth shall thee defend;
 I thy buzzing soon will end.

BRUCE.

The common *glow-worm*, 'the little planet of the rural scene,' may be observed in abundance in the month of August, when the earth is almost as thickly spangled with them as the cope of heaven is with stars. The glow-worm, like the cricket, lady-bird, and many other insects, makes but little use of its

wings; for they are seldom seen on any situation more elevated than the summit of a barley-ear, or a stunted furze-bush; but are generally found on banks under hedges, and sometimes in the interstices of rugged elm-roots and the foundations of buildings.

To the GLOW-WORM.

Gem of the lone and silent vale,
Treasure of evening's pensive hour!
I come thy fairy rays to hail,
I come a votive strain to pour.

Nor chilly damps, nor paths untrod,
Shall from thy shrine my footsteps fright;
Thy lamp shall guide me o'er the sod,
And cheer the gathering mists of night.

Again the yellow fire impart;—
Lo! planets shed a mimic day;
Lo! vivid meteors round me dart;
On western clouds red lightnings play!

But I disdain these garish fires,
Sporting on evening's sultry wing;
Thy humbler light my eye admires,
Thy soft retiring charms I sing.

Thine is an unobtrusive blaze,
Content in lowly shades to shine;
And much I wish, while thus I gaze,
To make thy modest merit mine.

For, long by youth's wild wishes cast
On the false world's tempestuous sea,
I seek retirement's shore at last,
And find a monitor in thee.

MRS. OPIE.

The solitary bee (*apis manicata*), and the white moth (*phalæna pacta*), are observed in this month; the *ptinus pectinicornis* also makes its appearance. The larvæ of this insect are very destructive to wooden furniture, boring holes in tables, chairs, bed-posts, &c.;—they are much inclined to lay their eggs in beech, hence this wood is less fit for the manufacture of domestic utensils. If their eggs are depo-

sited on the surface, frequent rubbing will preserve wooden furniture.

The southern counties of England, particularly Surrey and Kent, now yield their valuable produce of *hops*, in this month. The common hop (*humulus lupulus*) is propagated either by nursery plants, or by cuttings. These are set in *hills*, formed by digging holes in the spring, which are filled with fine mould, and the number of which varies from 800 to 1000, or 1200 per acre. One, two, or three plants are put in each hill; but, if hops are designed to be raised from cuttings, four or five of these, from three to four inches in length, are planted and covered one inch deep with fine mould. Hops begin to flower about the latter end of June or the beginning of July. The poles are now entirely covered with verdure, and the pendent flowers appear in clusters and light festoons, and form an object infinitely more picturesque than the far-famed vineyards of France.

The hops, which are the scaly seed-vessels of the female plants, are, when the seed is formed (generally about the end of August), picked off by women and children: for this purpose, the poles are taken up with the plants clinging to them. This and the subsequent operations necessary to fit the hop for the use of the brewer, are well described by Dr. Booker in his '*Hop-Garden*,' a Poem:—

Unsummoned, blithesome, now advance
The willing *pickers* to the garden's bound;
Where, placed to meet the moisture-drinking ray,
They plant the *crib* capacious. Soon commence
Their various tasks. All emulous to please,—
Some, loos'ning to and fro the *wreathed poles*,
Extract them from Earth's bosom, and them bear
To others stationed at the ready *crib*,
Who soon with nimble fingers them divest
Of all their blossomed pride. The spiral *bines*,
A seeming load, behold! the youngster-tribe
Hug in their little arms, and, high compiled,
Devote them to the flame. Consumed, these yield
The soil nutritious aliment saline,

And aid its future need. From *bin* to *bin*,
 Assiduous hies the *planter*, and surveys
 The general work—commends, instructs, reproves—
 As industry, and ignorance, and sloth,
 May sev'rally require—bids for the *kiln*,
 Lend mercifully, *Dobbin*, now grown old,
 That has for many a season lent her aid,
 And, conscious, seems to share the festive joy.

The *blossoms*, newly picked, behold conveyed
 To the domestic *kiln*, which nicest care
 Heats to extract from ev'ry fragrant leaf
 The vegetable moisture unexhaled
 By summer's fervid pow'r. O, *planter*! now
 At stake is all the produce of thy toil.
 If heat excessive scorch thy gathered store,
 Worthless as arid chaff, by winnowy sails
 Out cast deceptive to expectant birds,
 No flavoured essence to the tepid *vat*
 Will it impart, and to thy purse no gold.

By slow degrees, when parched to th' inmost core,
 The severed clusters thence to ampler space
 Convey, and let thy swains, with shovel broad,
 Throw them; alternate, long, from side to side,
 Fast flick'ring, countless, like soft flakes of snow.

Now, dry as leaves which rustle to the tread,
 When Autumn, frosty bright, disrobes the groves,
 And strews their golden honours o'er the glade,
 The last concluding task they claim is thine.
 The *hempen sacks*, capacious, high suspend,
 Till satiate, each (close trod by pressing feet)
 Swells to its measured bulk rotund, and waits
 A welcomed journey to the neighb'ring mart¹.

The hop is a most valuable plant: in its wild state it is relished by cows, horses, goats, sheep, and swine. When cultivated, its young tops are eaten, early in the spring, as substitutes for asparagus, being wholesome and aperient. Its principal use, however (could brewers be made honest), is in brewing malt liquors, communicating that fine bitter flavour to our beer, and making it keep for a longer time than it otherwise would do. Hops also serve some important purposes in medicine.

¹ See also Smart's 'Hop-Garden,' in his Poems.

The *hop-plant* is recorded to have been introduced into this country in the year 1524; but the estimation in which it was held for some years afterwards was so remarkably low, that in 1528 a petition to restrain its use was presented to parliament, and, in that petition, it was denominated a '*most pernicious and wicked weed*.' Though thus styled at this period, it became a great favourite before the century expired; and, in 1603, an act was passed to prevent the hops being adulterated.

The heat of this month is *sometimes* excessive, and we are then led to exclaim with the poet of nature,

Welcome, ye shades! ye bowery thickets, hail!

Ye lofty pines! ye venerable oaks!

Ye ashes wild, resounding o'er the steep!

and, regarding coolness and freshness as indispensable to the enjoyment of Nature's bounties at this season, those who are confined in large cities luxuriate themselves with the '*frequent ice*,' and employ every means in their power to cool the various liquors, which the heat renders necessary to relieve the '*parched and fevered lip*' of thirst. To such, as well as to our country readers, we recommend the perusal of Mr. Parkes's notice of *Snow and Ice*, as conducing to the luxuries of man, to be found in his ingenious '*Chemical Essays*,' vol. i, pp. 239-264.

Towards the end of the month, the wild orach (*chenopodium album*), the wild clary (*salvia verbenaca*), the sweet gale (*myrica gale*), the golden rod (*senecio paludosus*), the milk-thistle (*carduus marianus*), and ladies-traces (*ophrys spiralis*), have their flowers in full bloom.

Several *maritime* plants flower this month;—glass-wort (*salicornia herbacea*), and grass-wrack (*zostera marina*), on sea coasts; the samphire (*crithmum maritimum*), and the *asparagus officinalis*, among rocks. On *sandy shores* may be seen the sea campion, or catchfly (*silene maritima*), sea spurge (*euphorbia paralia*), and lavender cotton (*santolina mari-*

tima). On sea shores are found the sea-stock (*cheiranthus sinuatus*), and sea wormwood (*artemisia maritima*).

In this, and the succeeding month, much knowledge may be gained of marine plants, shells, &c. &c., by those who visit the sea-coast. The healthful amusement of wandering over the sands or beach, and among the caverns of our sea-girt isle, may easily be rendered improving to the mind, as well as the body, by bringing us acquainted with the great Author of Nature, in the apparently most insignificant, but wonder-fraught, works of his almighty hand. With this view, we lay before our readers the following interesting narrative of the examination of some shell-fish (*echini marini*), commonly called sea-eggs, from the pen of that eloquent naturalist, Sir John Hill¹.

‘The creature brought to town on this occasion was yesterday put into a large earthen vessel, with a flat bottom, filled with clear salt water. It was alive, and I had a happy opportunity of explaining all its parts to my auditory. The whole shell is of a figure nearly globular; but, in the centre of the base, or that part which is always next the bottom, there is a large opening, in which is placed the mouth of the animal; and on the very summit, or top of the shell, there is another, somewhat smaller, at which the intestines terminate, and by which the remains of the food, after it has served the purposes of digestion, are discharged. This seems, at first sight, a strange situation for these parts; but as the creature feeds on things which it finds at the bottom of the sea, and its digestive faculties are weak, and perform their functions but slowly, no other position of them could have answered the purpose.

¹ See the Inspector, No. 68. It is also reprinted in Dr. Drake's Gleaner, vol. ii, p. 211, a book of which it is impossible to speak too highly.

‘ From the top of the shell to the edge of the opening in the base, there run, at equal distances, five broad lines; these are of a different appearance from the rest of the surface, and are full of almost innumerable perforations, or little holes. These, in the dry empty shell, as preserved in collections, are easily distinguished by their letting through the light; but, while the animal is living in it, they are only discovered by their uses. Between these lines there run about thirty distinct series, or rows, of little eminences, of different figure and size in the dried shell; but, in the living animal, each of these supports a regular spine or prickle, like that on the skin of the hedgehog, and from these the creature had its Latin name.

‘ These were all entire on the living animal which was the subject of our observation, and the several series of them were longer and shorter, according to the differences of the eminences on the surface of the dry or naked shells. These spines hung flaccid, when we took the creature out of the bladder in which it had been brought to town; but the first thing it did, on being put into the fresh water, was to erect them all; so that the surface appeared as if thick set with needles with the points outward. We had the patience and attention to count the spines of one division, and found, by this, the whole number to be not less than four-and-twenty hundred. The creature, by the vibratory motion it first gave them, showed us that they were much at its command; and, on examination, we found that each of them had its separate muscle affixed to its base, and running through a small aperture in the head of an eminence on which the spine turns, as the bones of our bodies at their joints. What an apparatus is this for an animal esteemed so inconsiderable! The muscles of the human body are hardly five hundred, and here are between two and three thousand in this creature!

‘ One of the uses of the spines or prickles of this animal, is evidently the defending it from those fish which feed on many other of the testaceous animals ; but it soon showed us another very important purpose for which they were bestowed ; it suddenly bent a multitude of those of the lower part of the shell, all in the same direction downward, and used them as legs, performing its progressive motion by means of them. It was easy to perceive, that the smooth bottom of the vessel was troublesome for it to walk on : after throwing itself sideways, and bringing others of the spines to bear, and using them as legs, as it had done the former, it found motion any way inconvenient ; it placed itself on the base again, and prepared for rest.

‘ It is easy to conceive, that a creature of this globular form, if it had no better means of keeping its place than had hitherto appeared, must be rolled about by every motion of the water, and have its armature of spines soon destroyed. We quickly found, however, that nature had not left it unprovided with a security against this danger : it had no sooner placed itself for rest, than we saw a multitude of long and slender white fleshy filaments, resembling the horns of snails, playing in the water all about its surface : these were considerably longer than the spines in their ordinary state, and the creature extended them beyond that at its pleasure. One of these we found proceeded from every hole in the five lines before mentioned, on the surface of the shell ; and their number, in the whole, was not less than thirteen hundred. After these had been waved about in the water for some time, we were let into their use ; they were directed from all parts towards the bottom of the vessel, and fixed themselves so firmly to it at their extremities, that we found it afterwards very difficult to move the creature. On throwing a living worm into the water, all these filaments were drawn back in an instant ; and we had

the pleasure to see the animal move toward the prey, seize on it, and eat it.'

Like all other kinds of animals, *shell fish* have their particular resorts; some inhabit only the deep parts of the sea, some are found in less depths, others in shallows, in bays, and even on the shores; it has been also observed, that many very fine and rare specimens are sometimes found in narrow straits between islands, and in shallows of four or five fathoms water.

The best *live shells* are collected by means of a trawling-net, such as are used by fishermen, if the depths will permit; they are also brought up by the cable in weighing anchor, the log-line in sounding, &c.

After a storm, good shells may be picked up on the sea beaches, or shores, as the violent agitation of the water in a tempest separates them from their native beds, and often casts them on the shore; but such as have been exposed for some time to the heat of the sun, or beaten by the waves, are of little value, as their colours will be faded, and the shells worn and broken: choose, therefore, always such shells as lie in the deepest parts of their resorts and under water, whether taken up by the drag-net, from the sides of rocks, or bottoms of ships, &c.

River shells are, in general, very obscure in appearance, seldom admit of elegant colouring, and are extremely thin and brittle.—See *Donovan's Instructions for collecting and preserving Subjects of Natural History*, p. 59, to which ingenious work we also refer for the mode of cleaning and preserving shells, lithophyta, zoophyta, &c. To preserve marine plants, sea-weeds, &c., consult our last volume, p. 183.

In myriads now are caught, of heav'nly blue,
The honey *pilchard*, robed in silver too,
One haul producing oft upon the shore
Full sixteen thousand fish, and sometimes more;
For frying famed, while some, in pickle stowed,
Preserve till winter in their hooped abode.

The pilchard, though smaller, bears a strong resemblance to the herring, and is, by persons fond of the latter fish, very much esteemed; though, if possible, more boney. The pilchard is salted in large quantities, and sent to London in casks; where, in that state, it eats very much like the anchovy. These fish are caught in immense quantities during the season, and are sold at one shilling, and one and sixpence the hundred.

Now oft, prognostic of approaching gales,
The dark and flound'ring *porpoise* inland sails;
O'er ocean's breakers rears its curvy back,
Studding the green and white with nobs of black.

This very ugly creature generally approaches the land previously to a high gale of wind coming on, and is sometimes hauled in with the seine, though not frequently. The fisherman will often skin the porpoise, which he causes to be tanned, and then converts it into shoe leather.

Cucumbers, which are very plentiful in this month, are grown in great quantities at Sandy in Bedfordshire and the neighbouring country. They are sown in the open ground, in drills, every eight or nine days, that some seed may always be in the ground to come up and succeed, in case that which is up should be cut off by the frost. In this state, perhaps, half, or a whole acre of ground or more, is to be seen with cucumber plants in all stages. Two thousand bushels have been sold out of the parish of Sandy in one week. They are carried by the gardeners with carts to St. Neots, Cambridge, London, and as far as Stamford in Lincolnshire, and sold at the low price of three large or five smaller ones for a penny: they have been sold as low as sixteen for a penny. To persons who have hitherto seen cucumbers growing only in frames, or under hand-glasses, this extensive manner of growing them, and the cottages situated in the gardens, may serve to illustrate a passage in the first chapter of *Isaiah* (verse 8),

‘ *The daughter of Zion is left as a cottage in a vineyard, as a LODGE in a garden of CUCUMBERS.*’

The method of preserving the seed is, when the fruit is ripe, to cut the seed out into a tub, and let it remain till it begins to ferment; then put it into water, and wash it from the mucus, and spread it upon cloths to dry.

INSCRIPTION for a GROTTO.

To me whom in their lays the shepherds call
Actea, daughter of the neighbouring stream,
 This cave belongs. The *fig-tree* and the *vine*,
 Which o’er the rocky entrance downward shoot,
 Were placed by *Glycon*. He with *cowslips* pale,
Primrose, and purple *lychnis*, decked the green,
 Before my threshold, and my shelving walls
 With *honey-suckle* covered. Here at noon,
 Lulled by the murmur of the rising fount,
 I slumber: here my clustering *fruits* I tend.
 Or from the humid *flowers*, at break of day,
 Fresh garlands weave, and chase from all my bounds
 Each thing impure or noxious. Enter in,
 O stranger, undismayed. Nor *bat* nor *toad*
 Here lurks: and if thy breast of *blameless thoughts*
 Approve thee, not unwelcome shalt thou tread
 My quiet mansion: chiefly, if thy name
 Wise *Pallas*, and the immortal *Muses* own.

AKENSIDE.

SEPTEMBER.

SEPTEMBER is composed of *septem*, seven, and the termination *ber*, like *lis* in *Aprilis*, *Quintilis*, *Sex-tilis*. This rule will also apply to the three following months, Octo-ber, Novem-ber, Decem-ber. Our Saxon ancestors called it *Gerst-monat*, ‘for that barley which that moneth commonly yeilded was antiently called *gerst*.’

Remarkable Days.

1.—SAINT GILES.

GILES, or Ægidius, was born at Athens, but came to France in the year 715. Charles Martel, when hunting, found him in his hermit's cell, and, pleased with his unaffected piety and sanctity of manners, erected an abbey for him at Nismes, of which he was constituted abbot. He died in the year 795.

*1. 1715.—LOUIS XIV DIED.

During the reign of this king, the privileges of the Protestants in France were gradually infringed; and missionaries were sent for their conversion, supported by regiments of dragoons, who exercised the most horrid cruelties upon the defenceless Protestants in the south of France, particularly at *Montauban* and *Nantes*. This bigoted sovereign declared, in his letters of instruction to his officers, '*That it was his Majesty's will that the extreme of rigour should be employed against those who refused to become of his religion.*' In 1685, the *Revocation of the Edict of Nantes*, first granted by Henry IV, and confirmed by Louis XIII, deprived the Protestants of all exercise of their religion, and tore from them their children to be educated Catholics. Vast numbers of Protestants, in consequence, left the kingdom, and carried their arts and industry to foreign and hostile nations.

2.—LONDON BURNT.

The fire of London broke out on Sunday morning, September 2d, 1666, O.S.; and, being impelled by strong winds, raged with irresistible fury, nearly four days and nights; nor was it entirely mastered till the fifth morning after it began. For an interesting account of this tremendous fire, written by an eye-witness, we refer to our last volume, pp. 249-258.

*3. 1658.—OLIVER CROMWELL DIED.

Oliver Cromwell was of a robust make and constitution; his aspect manly, though clownish. His education extended no further than a superficial knowledge of the Latin tongue, but he inherited great talents from nature; though they were such as he could not have exerted to advantage at any other juncture than that of a civil war, inflamed by religious contests. His character was formed from an amazing conjuncture of enthusiasm, hypocrisy, and ambition. He was possessed of courage and resolution, that overlooked all dangers, and saw no difficulties. He dived into the characters of mankind with wonderful sagacity, while he concealed his own purposes under the impenetrable shield of dissimulation.

He reconciled the most atrocious crimes to the most rigid notions of religious obligations. From the severest exercise of devotion, he relaxed into the most ridiculous and idle buffoonery: yet he preserved the dignity and distance of his character in the midst of the coarsest familiarity. He was cruel and tyrannic from policy; just and temperate from inclination; perplexed and despicable in his discourse; clear and consummate in his designs; ridiculous in his reveries; respectable in his conduct; in a word, the strangest compound of villany and virtue, baseness and magnanimity, absurdity and good sense; that we find on record in the annals of mankind.—*Noble.*

7.—SAINT EUNERCHUS.

Eunerchus, or Evortius, was bishop of Orleans, and present at the council of Valentia, A.D. 375.

8.—NATIVITY OF THE VIRGIN MARY.

A concert of angels having been heard in the air to solemnize this important event, the festival was appointed by Pope Servius about the year 695.

*10. 1806.—J. C. ADELUNG DIED.

Adelung, so well known in the literature of Germany, by his great *Grammatical and Critical Dic-*

tionary,' in five volumes, quarto, lived to the age of seventy-two. Until near his death, he devoted *fourteen hours* every day to study and composition. He was never married: and it was said of him, that his writing-desk was his wife; and his children *seventy* volumes, great and small; all the produce of his pen. He loved the pleasures of the table, and wines were the only articles in which he was expensive. His cellar, which he used to call his *Bibliotheca Selectissima*, contained forty kinds of wine; yet, amid this plenty, his strength of constitution and gaiety of spirit enabled him to sustain his literary labours without injury to his health.

*13. 1806.—CHARLES JAMES FOX DIED.

*A patriot's even course he steered
Mid Faction's wildest storms unmoved;
By all who marked his mind—revered;
By all who knew his heart—beloved.*

FITZGERALD.

14.—HOLY CROSS.

This festival was first observed in the year 615, on the following occasion: Cosroes, King of Persia, having plundered Jerusalem, carried away large pieces of the cross which had been left there by the Empress Helena. Heraclius, the emperor, soon afterwards engaged and defeated him, and recovered the cross; but, bringing it back in triumph to Jerusalem, he found the gates shut against him, and heard a voice from heaven, saying, that the *King of Kings* did not enter into that city in so stately a manner, but *meek and lowly, and riding upon an ass*. The emperor then immediately dismounted from his horse, and walked through the city barefooted, carrying the cross himself.

17.—SAINT LAMBERT.

Lambert was Bishop of Utrecht, in the time of King Pepin I; but, reproving the king's grandson for his irregularities, he was cruelly murdered at the instigation of an abandoned woman.

21.—SAINT MATTHEW.

In the year 64 or 65 Matthew wrote his Gospel in

Hebrew, which was afterwards translated into Greek. After many labours and miracles, he closed his life at Nadabar in Ethiopia, probably by martyrdom.

22. 1761.—CORONATION OF KING GEORGE III.

26.—OLD HOLY ROOD. See HOLY CROSS, p. 258.

26.—SAINT CYPRIAN.

He was an African by birth, of a good family, and well educated. He suffered martyrdom under Valerianus and Gallienus, in 258.

*27. 1540.—JESUITS FOUNDED.

29.—SAINT MICHAEL.

Saint Michael was an archangel who presided over the Jewish nation, and had an army of angels under his command and conduct; he fought also with the Dragon or Satan, and his angels; and, contending with the Devil, he disputed about the body of Moses. This festival has been kept with great solemnity ever since the sixth century. About this time of the year, it has been, and still continues, the custom to elect the governors of towns and cities. On the election of a *bailiff* at *Kidderminster*, the inhabitants assemble in the principal streets to *throw cabbage-stalks at each other*.—See T. T. for 1815, p. 259.

The custom of having a 'roast goose' for dinner (seasoned with sage and onions and port wine) on Michaelmas Day, is of very antient standing; yet the cause why remains unexplained; though as Beckwith remarks in his new edition of Blount's 'Jocular Tenures,' it was probably for no other reason but that Michaelmas Day was a great festival, and geese at that time most plentiful. Poor Robin, in his Almanack for 1695, has the following lines:

GEESE now in their *prime season* are,
Which, if well roasted, are good fare;
Yet, however, friends, take heed,
How too much on them you feed,
Lest, when as your tongues run loose,
Your discourse do *smell of Goose*.

30.—SAINT JEROME.

Jerome translated the Old Testament into Latin:

this version, now styled the *Vulgate*, is the only one used or allowed by the Romish church. He died in the eightieth year of his age, A.D. 422.

Astronomical Occurrences

In SEPTEMBER 1817.

THE Sun enters Libra at 28 m. after 10 in the morning of the 23d of this month; when the length of the day and night will be equal on all parts of the globe. The length of the days during this period will appear from the following

TABLE

Of the Rising and Setting of the Sun for every fifth Day of the Month.

Monday,	Sept. 1st,	Sun rises 14 m. after 5.	Sets 46 m. after 6
Saturday,	. 6th,	. . . . 24 5 .	. 36 6
Thursday,	. 11th,	. . . . 34 5 .	. 26 6
Tuesday,	. 16th,	. . . . 43 5 .	. 17 6
Sunday,	. 21st,	. . . . 53 5 .	. 7 6
Friday,	. 26th,	. . . . 3 6 .	. 57 5

We have already explained, that the time as indicated by a good sun-dial is sometimes too great and sometimes too little, or, in other words, that the Sun is sometimes too fast, and at others too slow, with respect to mean time; and the following table shows what is to be subtracted from the time shown by the dial to obtain that which should be indicated by a well regulated clock during the present month.

TABLE,

Shewing what is to be subtracted from the Time as given by a good Sun-Dial, on every fifth Day of the Month.

September 1st,	from the time by the dial subtract	m.	s.
6th,	1	45
11th,	3	26
16th,	5	10
21st,	6	55
26th,	8	39

The Moon enters her last quarter at 2 m. past 9 on the evening of the 3d of the present month. There will be a new Moon at 43 m. after 6 in the morning of the 11th; the first quarter will commence at 3 m. after 11 at night on the 17th; and she will be full at 47 m. past 9 in the morning of the 25th. The Moon will also be in conjunction with the star marked α in Libra, at 57 m. after 12 on the night of the 14th; and she will be on the meridian at the following convenient times for observation:

September	9d,	at 31 m. after	4	in the morning
	3d,	10	5	
	19th,	43	7	in the evening
	20th,	39	8	
	21st,	32	9	
	22d,	21	10	
	23d,	6	11	

The Georgium Sidus will be in quadrature at 54 m. past 7 in the evening of the 4th of this month. Mercury will attain his greatest elongation on the 14th; and on the 18th he will be in conjunction with Spica in Virgo, when the star will be 61' north of the planet. Mercury will also appear stationary on the 27th.

The visible eclipses of Jupiter's satellites this month will be as follow:

EMERSION.

1st Satellite	20th,	at 4 m. past	7	in the evening
2d Satellite	9th,	33	7	

ON THE CALCULATION OF ECLIPSES.

[Continued from p. 136.]

On the apparent Diameters of the Terrestrial and Lunar Shadows.

In order to calculate the magnitude and duration of eclipses of the Moon, it is necessary to ascertain the diameter of the Earth's shadow where it is crossed by the orbit of the Moon; and this may be

accomplished by the following simple method. In the preceding fig. (p. 231) let MM' be a part of the Moon's orbit considered as circular, then the apparent semidiameter of the shadow seen from the Moon at that distance is the angle MEC , which is equal to the difference of the two angles ECM and EMA . This last angle EMA is the apparent semidiameter of the Earth seen from the Moon; or, in other words, it is the horizontal parallax of the Moon at the time of the eclipse. With respect to the angle ECM , it is equal to the apparent semidiameter of the Sun diminished by his horizontal parallax; as shown in the note in p. 232. And, therefore, to find the semidiameter of the Earth's shadow at the distance of the lunar orbit, it will be sufficient to add the parallaxes of the Sun and Moon together, and subtract the sum from the apparent semidiameter of the Sun. Thus, let D denote the apparent diameter of the Sun, p and p' the solar and lunar parallaxes, and D' the diameter of the Earth's shadow at the place required; then $\frac{1}{2}D' = \frac{1}{2}D - (p + p')$. Calculating according to this formula, with the quantities already found for the greatest, mean, and least parallax of the Moon, we obtain the following values for the semidiameter of the Earth's shadow, where it is traversed by the Moon in her orbit MM' ; viz.

Sun in perigee .	{	Moon in perigee .	4524".3
		Moon at mean dist.	4982".3
		Moon in apogee .	5440".4
Sun at his mean distance .	{	Moon in perigee .	4556".9
		Moon at mean dist.	5014".8
		Moon in apogee .	5472".9
Sun in apogee .	{	Moon in perigee .	4588".3
		Moon at mean dist.	5046".3
		Moon in apogee .	5504".2

The greatest apparent diameter of the Moon being only 2011".07, it may evidently be wholly im-

mersed in the Earth's shadow, which so much exceeds it. Hence, whenever the Moon traverses the middle of this shadow, or her centre either coincides, or nearly so, with its axis, there will be a total eclipse of the Moon.

The diameter above calculated is that of the shadow projected by the opaque body of the Earth. But the inferior beds of the atmosphere absorb so much of the light as to cause a sensible shadow; for the apparent diameter of this shadow which is deduced from observation always exceeds that found by calculation. This difference is generally estimated at $0^{\circ}.0279$, or about $\frac{1}{360}$ th of the whole diameter; but it must necessarily vary with the state of the terrestrial atmosphere. The time which the Moon requires to pass through this shadow depends upon the difference of her diameter and that of the shadow, as well as upon the proximity of her centre to its axis and her horary motion. Both these circumstances will be elucidated in a subsequent part of this article.

The apparent diameter of the lunar shadow at the distance of the Earth may be calculated in the same manner, by substituting the corresponding quantities as they would appear to an observer situated at the surface of the Moon. Thus, the semidiameter of the lunar shadow, with respect to that observer, would be equal to the sum of the parallaxes of the Sun and the Earth, diminished by the apparent semidiameter of the Sun, the value of each quantity being calculated for an observer situated at the Moon. The parallax of the Earth is only the apparent semidiameter of the Moon, seen from the Earth; all the necessary quantities are therefore given. The formula would be simplified by neglecting the parallax of the Sun, the influence of which upon the result is almost insensible, as it is always less than half a second. Then, *the semidiameter of the lunar shadow is equal*

ance of the Sun from the Earth being about 400 times that of the Moon, the angle $CS'n'$ can never

exceed 2 minutes divided by 400, or $\frac{2'}{400} = \frac{120''}{400} =$

$\frac{3}{10}$ ths of a second of a degree; and, consequently, the lines $S'C$ and $S'O$ may be regarded as sensibly parallel to each other. The angle $Cn'O$ is therefore equal to nCn' ; or the apparent semidiameter of the lunar shadow is equal to the excess of the apparent semidiameter of the Moon above that of the Sun, as previously stated.

If we make the calculations indicated at the close of the preceding part of this article, under circumstances the most favourable to the length of the shadow, or those in which the Sun is in apogee, and the Moon in perigee, it will be found that the semidiameter of the lunar shadow, at the distance of the Earth, as seen from the Moon, is equal to $60''.264$; the apparent semidiameter of the Earth at that distance is equal to the horizontal parallax of the Moon at the same time; that is, to $1^{\circ}.024722$. Hence, in the most favourable circumstances, the breadth of the lunar shadow is to that of the disc of the Earth as 1 to 61.2; and, therefore, this shadow will not cover a 60th part of the breadth of the terrestrial hemisphere, and consequently not $\frac{1}{3600}$ th part of its surface. Under circumstances less favourable, the breadth of the shadow would be still less; and when the apparent diameter of the Moon is just equal to that of the Sun, it becomes equal to nothing; and negative when the apparent diameter of the Sun exceeds that of the Moon. In the first case the vertex of the shadow will just reach an observer on the Earth, and, in the latter, it will fall short of him.

Notwithstanding the extremity of the Moon's shadow would not arrive at an observer situated on one part of the Earth, it might reach another differently situated; for the difference of situation alone causes a

considerable variation in the distance of the Moon from the Earth. We have already remarked that this difference amounts to about $\frac{1}{60}$ th of the distance between the Moon being in the horizon and in the zenith of the observer; and this has a sensible effect upon her apparent diameter; but the great distance of the Sun renders this effect upon his apparent diameter insensible. Hence it follows, that to one of the observers so situated, the apparent diameter of the Moon would be less than that of the Sun, while to the other it would be greater. In the former case the shadow would not reach the observer; in the latter it would arrive at him. The position of the observer at the moment of a solar eclipse is, therefore, very important; as according to this it either may or may not be visible to him. The least apparent diameter of the Sun is about 1891", and that of the Moon at her mean distance, being 1878", less than that of the Sun, there cannot be any total obscuration at this limit, and still less when the Moon is beyond her mean distance from the Earth. It is also evident, from what is observed above, that only a small portion of the terrestrial hemisphere can be covered with it at once, and that frequently the shadow does not reach the Earth at all; hence eclipses of the Sun ought to happen much seldomer than those of the Moon, which experience likewise proves to be the case.

[To be continued next month.]

The Naturalist's Diary.

Now sober Autumn, with lack lustre eye,
Shakes with a chiding blast the yellow leaf,
And hears the woodman's song
And early sportsman's foot.

SEPTEMBER, like the following month, often boasts many fine days, at least till the commencement of the autumnal equinox on the 22d, when a

change in the weather generally takes place. The mornings and evenings are cool, but possess a delightful freshness, while the middle of the day is pleasantly warm and open.

Still many a flower bedecks the garden walks,
While that by rustics '*farewel-summer*,' named
With starry lustre eyes the waning day.
Still is the orchard fragrant, still the glow
Of second summer o'er the fields prevails:
Soft floats the morn amid the lingering fogs,
Till the warm ray that gilds their fleecy robes
Dissolves them, opening wide the prospect round.

BIDLAKE.

Within the last few years, indeed, September has proved the finest and most settled month of the whole twelve; this was particularly the case in the autumns of 1815 and 1816. On the protracted delightfulness of the weather in the former year, we quote the following lines of an anonymous poet:—

SEPTEMBER wanes, and still the Summer's smile
Hangs lingering—lovely—o'er Britannia's isle;
SEPTEMBER wanes—and yet the autumnal blast
O'er nature's scenes no devastations cast;
Still clings the foliage to the parent tree;
Still bloom the flowers to feast th' insatiate bee.
The swallow bent his emigrating way,
Found climes that feel the sun's unfading ray;
Yet on his journey, as he looked behind,
Saw still the SUMMER's fairy charms combined;
Turned on his wing again to that dear home,
And sadd'ning mourned that Winter e'er should come
With her chill blast, her cold ungenial air,
To make him seek a land more warmly fair.
SEPTEMBER wanes, protracted Summer laughs,
And all around her cup of gladness quaffs¹.

Each season of the revolving year produces a variety of picturesque appearances peculiar to itself. The emotions which affect the mind, while it contemplates

¹ These lines are by the author of the '*Cossack*,' a poem, and appeared in the Morning Chronicle of November 16, 1815.

scenes. which every month contributes to diversify, must, consequently, be of various kinds, all suitable to the season. The vivid beauties of spring, the glowing skies of summer, the fading scenes of autumn, and the dreary aspect of winter, excite, respectively, vivacity, languor, solemnity, or dejection. Summer, refulgent 'child of the Sun,' has retired with 'his ardent look' from our northern regions, and each gaudy flower disappears. Rural scenery, however, is much enlivened by the variety of colours, some lively and beautiful, which are assumed, towards the end of the month, by the fading leaves of trees and shrubs.

How sweetly pleasing to behold
Forests of vegetable gold!

How mixed the many chequered shades between
The tawny mellowing hue, and the gay vivid green!

FAWKES.

Striking as these appearances are in our own fine forests, in different parts of England and Wales, particularly in some mountainous districts, yet they bear no comparison to those which a land wild and savage must ever present to the eye of the enraptured traveller. These peculiar beauties disappear at the approach of civilization. In *Europe*, the soil abounds only in plants which are of use to man. Domestic vegetables, by the aid and protection of the cultivator, have so trenched upon the domain of the wilderness, that space is scarcely left for the existence of those for which man has no call. The primeval forests of the Gauls and Germans have disappeared. Forests at this time of day are mere formal plantations of large extent. They are intersected in all directions by roads and paths; are explored without difficulty; and the wild animals no longer find safe refuge in them. Generations of trees are renewed in quick succession, on a soil which the industry of the proprietor keeps in constant requisition, and it is mere chance

when a single stick is left to end its career by old age. Far in the north there are several forests which still preserve some traces of the primeval vegetation of Europe. In these the oaks, spared by the axe, acquire an enormous size; while others, worn out by age, fall of themselves, are decomposed, and help unceasingly to augment the surface of the soil covered with high mosses and thick lichens, that preserve a prolific moisture.

None, however, approach in magnificence the forests which shade the equinoctial regions of Africa and America. One is never satiated in admiring there the endless multitude of vegetables brought into near contact with each other, and mingled promiscuously together; so different among themselves, and often so extraordinary in structure and produce; those enormous trees still exhibiting no symptoms of decay, though their age goes back to a period at but little distance from the last revolution of our globe; those towering *palms*, contrasting by their simple forms with all that surrounds them; those extensive climbers; those *ratans* which, knitting together their long and flexible branches by numberless knots and turns, encircle as one group the whole vegetation of these extensive regions. To clear a path through these, neither fire nor axe is sufficient; the one extinguishes for want of circulation in the air, the other is broken or blunted by the hardness of the wood it meets. The soil cannot afford place to the numberless germs which it developes. Each tree disputes with others, which press from all sides, the soil it wants for its existence; the strong stifle the weak; while rising generations obliterate even the slightest trace of destruction and death: vegetation never flags; and the earth, so far from becoming exhausted, acquires new fertility from day to day. Hosts of animals of every kind, insects, birds, quadrupeds, reptiles, beings as diversified and strange as the vegetation of the place itself, retire themselves under the vast canopy of these an-

tient thickets as into a citadel proof against the attack of man¹.

Partridges (*tetrao perdix*) are in great plenty at this season of the year: they are chiefly found in temperate climates, but no where in such abundance as in England. Partridges pair early in the spring: about the month of May, the female lays from fourteen to eighteen or twenty eggs, making her nest of dry leaves or grass upon the ground. The young birds learn to run as soon as hatched, frequently encumbered with part of the shell sticking to them; and picking up slugs, grain, ants, &c. While the corn is standing they have a secure retreat from their numerous enemies; but when the harvest is gathered in, they resort, in the daytime, to groves and covers. At night, however, they return to the stubble to avoid foxes, weasels, &c. and there nestle together. From man they have no means of escape; for they are traced to their hiding-places by pointers, and are often inclosed in nets, and taken by whole coveys.

When milder autumn summer's heat succeeds,
And in the new-shorn field the partridge feeds,
Before his lord the ready *Spaniel* bounds;
Panting with hope, he tries the furrowed grounds;
But when the tainted gales the game betray,
Couched close he lies and meditates the prey;
Secure they trust th' unfaithful field beset,
Till hov'ring o'er 'em sweeps the swelling net.

POPE.

The affection of the partridge for her young is peculiarly strong and lively. She is greatly assisted in the care of rearing them by her mate: they lead them out in common, call them together, point out to them their proper food, and assist them in finding it by scratching the ground with their feet; they frequently sit close by each other, covering the chickens with their wings like the hen. In this situation,

¹ See *M. Mirbel's General Views of Vegetable Nature*, in the Quarterly Journal of Science and the Arts, vol. ii, p. 41.

they are not easily *flushed*; and the sportsman, who is attentive to the preservation of his game, will carefully avoid giving any disturbance to a scene so truly interesting. Should the pointer, however, come too near, or unfortunately run in upon them, there are few who are ignorant of the confusion that follows. The *male* first gives the signal of alarm by a peculiar cry of distress, throwing himself, at the same moment, more immediately into the way of danger, in order to deceive or mislead the enemy; he flies, or rather runs, along the ground, hanging his wings, and exhibiting every symptom of debility, in order to decoy the dog to a distance from the covey: the *female* flies off in a contrary direction, and to a greater distance, but, returning soon after by secret ways, she finds her scattered brood closely squatted among the grass; and, collecting them in haste, she leads them from the danger, before the dog has had time to return from his pursuit.

Now mark

The fowler, as he stands and meditates
 The cruel deed! See how, with steady grasp,
 He holds the thund'ring messenger of death;
 His eye fixed,—levelled on the fatal tube;
 His forward leg.—Amidst the bristling corn
 His dog, as if by skilful *Flaxman* cut
 In Parian stone, or cast in lasting bronze
 By far-famed *Westmacott*, stands forth unmoved,
 Ready to give the deadly signal.—Hark!
 'Tis done—shot through the heart, she reels, she falls,
 Far from her nest; whilst th' unsuspecting mate
 Still leads the flutt'ring covey through the field¹.

There are in blow, in this month, nasturtia, china

¹ For this and other pleasing illustrations of Natural History, possessing much poetical merit, we refer the reader to Mr. M'Quin's '*Description of Three Hundred Animals*.'—See also, '*The Partridges*,' an Elegy, given at the end of this month's Diary.

aster, marigolds¹, sweet peas, mignonette, golden rod, stocks, tangier pea, holy-oak, Michaelmas-daisy, saffron (*crocus sativus*), and ivy (*hedera helix*). Among the *maritime* plants may be named, the marsh glass-wort (*salicornia herbacea*), and the sea-stork's bill (*erodium maritimum*), on *sandy shores*; and the officinal marsh-mallow (*althæa officinalis*) in *salt marshes*.

Herrings (*clupea*) pay their annual visit to England in this month, and afford a rich harvest to the inhabitants of its eastern and western coasts.

Various of the feathered tribe now commence their autumnal music :

The thrush, the blackbird, and the woodlark now,
Cheerer of night, their pleasing song resume ;
The stone-curlew his chattering note repeats ;
And the wood-owl continual breaks the depth
Of sylvan darkness with discordant moans.

Among the few insects that appear in this month, are the *phalæna russula*, and the saffron butterfly (*papilio hyale*). The snake *sloughs*, or casts its skin.

The oak begins to shed its acorns, and the beech nuts fall ; both of which are termed *mast*. A luxurious pasturage is afforded for such hogs as are kept on the borders of forests, for about six weeks, from the end of September. The method of treating hogs at this season of migration, and of reducing a large herd of these unmanageable brutes to perfect obedience and good government, is very curious.—(See our last volume, p. 272.)

¹ Mark how the bashful morn in vain
Courts the amorous *marigold*,
With sighing blasts and weeping rain ;
Yet she refuses to unfold :
But when the planet of the day
Approacheth with his powerful ray,
Then she spreads, then she receives,
His warmer beams into her leaves.

From oak to oak they run with eager haste,
 And, wrangling, share the first delicious taste
 Of fallen ACOBNS; yet but thinly found
 Till the strong gale has shook them to the ground.
 It comes; and roaring woods obedient wave:
 Their home, well pleased, the joint adventurers leave:
 The trudging Sow leads forth her numerous young,
 Playful, and white, and clean, the briars among,
 Till briars and thorns increasing, fence them round,
 Where last year's mould'ring leaves bestrew the ground;
 And o'er their heads, loud lashed by furious squalls,
 Bright from their cups the rattling treasure falls;
 Hot, thirsty food; whence doubly sweet and cool
 The welcome margin of some rush-grown pool.

BLOOMFIELD.

The autumnal equinox happens on the 22d of September, and, at this time, the days and nights are equal all over the earth. About this period, heavy storms of wind and rain are experienced, as well as at the vernal equinox.

To the HARVEST MOON.

Moon of Harvest, I do love
 O'er the uplands now to rove,
 While thy modest ray serene
 Gilds the wide surrounding scene;
 And to watch thee riding high
 In the blue vault of the sky,
 Where no thin vapour intercepts thy ray,
 But in unclouded majesty thou walkest on thy way.

Pleasing 'tis, oh, modest Moon!
 Now the night is at her noon,
 'Neath thy sway to musing lie,
 While around the zephyrs sigh,
 Fanning soft the sun-tanned wheat,
 Ripened by the summer's heat;
 Picturing all the rustic's joy
 When boundless plenty greets his eye,
 And thinking soon
 Oh, modest Moon!

How many a female eye will roam
 Along the road,
 To see the load,
 The last dear load of harvest home.

Storms and tempests, floods and rains,
 Stern despoilers of the plains,

Hence away, the season flee,
 Foes to light-heart jollity;
 May no winds careering high,
 Drive the clouds along the sky;
 But may all nature smile with aspect boon,
 When in the heavens thou show'st thy face, oh Harvest Moon!

'Neath yon lowly roof he lies,
 The husbandman, with sleep-sealed eyes;
 He dreams of crowded barns, and round
 The yard he hears the flail resound;
 Oh! may no hurricane destroy
 His visionary views of joy:
 God of the winds! oh hear his humble pray'r,
 And while the Moon of Harvest shines, thy blust'ring whirlwind
 spare.

KIRKE WHITE.

Flies (*musca*) in this, as in the preceding month, abound in our windows. Of the common house-fly we have already spoken¹; we shall now pursue this subject, by describing some other species of this curious genus. The *blue flesh-flies* feed wholly on the flesh of dead animals, and other decayed substances; as every one knows how difficult it is, in the summer, to preserve meat from their attacks. When they deposit their eggs upon it, the meat is called *fly-blown*; soon after, maggots are hatched from them, and these are the larvæ of the *musca vomitoria*, or blue flesh-fly. Larvæ of this kind, though with trouble and difficulty kept from the larder, may on the whole be considered as useful to mankind, inasmuch as they destroy and carry away putrid substances. The larvæ of some of these flies, especially that of the *musca cæsar*, a shining green fly, very common in hedges and gardens, are not content, however, with the flesh of dead animals, but attack living ones—that harmless and useful animal the *sheep* is particularly obnoxious to their attacks, and not unfrequently.

¹ See our last volume, pp. 240, 241.

The sheep knows its enemy, and tries all in its power to avoid it, but in vain : the fly usually settles on its rump, where it is least liable to be molested, and there among the wool lays its eggs ; these, when hatched, quickly find their way to the skin of the animal, which having destroyed, they penetrate into the flesh ; and, when they happen to be deposited near the abdomen, frequently enter the bowels of the animal and destroy it. Sometimes the sheep is attacked in several parts at the same time ; thus diseased, it has motions peculiar to itself, and will frequently wander from the rest, hide itself in some hedge or ditch, and die unobserved. The skilful and attentive shepherd seldom loses any of his flock from this cause ; he quickly discovers the malady, and without loss of time applies a remedy, cuts off the wool, clears away the larvæ, and pours train oil into the wound, to which he should add some oil of turpentine.

Cheese in a decayed state, and bacon not thoroughly cured, are the favourite food of the larvæ of another species of fly, much smaller than the preceding : the dealers in these articles give to these larvæ the name of *hoppers*. If attentively observed, they may be seen to form themselves into a kind of ring, and with great elasticity throw themselves to the height of five or six inches. Swammerdam was the first that noticed this manoeuvre, and has described it with that accuracy for which he is distinguished.

A few species of flies live in their larva state after the manner of ichneumons ; in the bodies of living caterpillars we have frequently observed them produced from the larvæ of the *phalæna potatoria*, or drinker moth, as well as the *phalæna salicis*, satin moth : but whether they lay their eggs on the outside, or whether they pierce the skin of the caterpillar, has not yet been ascertained. Most kind of fungi, or mushrooms, as they decay, are full of the maggots of various flies. Linnæus relates that, in Sweden, the larva

of a small fly, which he calls *musca frit*, lives in the ears of barley, and destroys at least every tenth grain, to the great loss of the husbandman.

The larvæ of some flies live in the heads of the compound flowers, others on the parenchymatous or fleshy part of the leaves of trees and plants, between the two skins ; some in the stalks of thistles, where they produce extraordinary tubercles : in short, the habitations of the several species are so numerous, that it would be taking up too much time to mention all of them. We have enumerated those of the most consequence, and by them we see that the maggots of flies are by no means an inactive set of beings, but of great consequence in the economy of nature.

When these larvæ are full grown, the skin hardens, and they change into a chrysalis, most commonly of an oval shape.

Fond as these insects are, in their larva state, of filth and putridity, in their perfect state they are more delicate in the choice of their food, supporting themselves generally by the nectar which they suck from flowers ; there are, however, a few instances to the contrary : though, in general, a very harmless genus, we are acquainted with two species that are of a sanguinary nature, and which feed on the juices of other flies, which they previously kill. The *musca stercoraria*, or dung-fly, which we generally observe on cow-dung, is one of this sort ; there is another species somewhat similar to it, but less hairy, found occasionally in the shop-windows in London, and doubtless elsewhere ; first observed by Mr. Benjamin White, sen., of Fleet-street, bookseller, in his shop-windows, feeding on the *musca domestica*, or common house-fly. One would think that the trunk of this insect was ill adapted for an instrument of death, but certain it is that it makes use of it to pierce the body, as well as to suck the juices of the fly ; we have many times been an eye-witness to it. On placing this fly, which we call *necatrix*, under a wine-glass

with the *musca domestica*, we have seen it presently seize, kill, and suck its blood: the chief difference that we discern in the proboscis of this and other flies is, that it is stronger, and apparently much stiffer.

Various are the means used to get rid of these troublesome guests, who not only pester us with their numbers, but contaminate our furniture: the most successful antidote is arsenic dissolved in water, with the addition of a little sugar; this they readily sip, and it quickly proves fatal. The composition has been, and is still, held as a secret by some; but, where there are children or servants, it will perhaps be better to bear the annoyance of the flies, than run the risk of poisoning some part of the family¹.

To a FLY.

Leave this pale, this bloodless cheek,
Foolish, noisy, flutt'ring thing;
Haste where fresher features call thee,
Flitting on thy azure wing.

On yon verdant bank reclining,
See Eliza's charms invite,
But, content with perching on them,
Stop, nor cruel seek to bite.

Safely suck the pearly moisture
On her jutting rosy lip;
Fan nor handkerchief oppose thee,
See the maiden's fast asleep.

Freighted with the pilfered fragrance,
Come and perch on me again;
Fear not on my lip to fasten;
Never fear, I won't complain.

But if still thou buzzest round me,
Quickly, quickly thou shalt die;
Thus, between my hands I'll crush thee,
An untow'ring vulgar fly.

GRÆME.

The chimney or common swallow (*hirundo rustica*) disappears about the end of the month. 'The con-

¹ See an interesting paper on the *Genus Musca*, by the late W. Curtis, in the Monthly Magazine for 1814, vol. xxxviii, p. 402.

gregating flocks of hirundines on the church and tower (says Mr. White¹) are very beautiful and amusing. When they fly off together from the roof, on any alarm, they quite swarm in the air. But they soon settle in heaps, and preening their feathers, and lifting up their wings to admit the sun, seem highly to enjoy the warm situation. Thus they spend the heat of the day, preparing for their emigration, and, as it were, consulting when and where they are to go. The flight about the church seems to consist chiefly of house martins, about 400 in number: but there are other places of rendezvous about the village frequented at the same time. It is remarkable that, though most of them sit on the battlements and roof, yet many hang or cling for some time by their claws against the surface of the walls, in a manner not practised by them at any other time of their remaining with us. The swallows seem to delight more in holding their assemblies on trees.

Of the migration and torpidity of the swallow, we have already treated at length, in our three former volumes; to them, therefore, we refer the ingenious naturalist, and to *Mr. Forster's Observations on the Brumal Retreat of the Swallow*, third edition, for further information on this curious subject. See also the '*Swallows*,' an Elegy, at pp. 128-130.

Amusive birds! say where your hid retreat,
When the frost rages, and the tempests beat;
Whence your return, by such nice instinct led,
When Spring, sweet season, lifts her bloomy head?
Such baffled searches mock man's prying pride;
The GOD of NATURE is your secret guide.

Many other of the small billed birds that feed on insects disappear when the cold weather commences. The *throstle*, the *red-wing*, and the *fieldfare*, which migrated in March, now return; and the *ring-ouzel*

¹ History of Selborne, vol. ii, p. 242.

arrives from the Welsh and Scottish Alps to winter in more sheltered situations. All these birds feed upon berries, of which there is a plentiful supply, in our woods, during a great part of their stay. The throstle and the red-wing are delicate eaters. The Romans kept thousands of them together in aviaries, and fed them with a sort of paste made of bruised figs and flour, &c. to improve the delicacy and flavour of their flesh.

Hazel-nuts are now ripe, and the filberd-tree is laden with its agreeable fruit. Many a youth may, at this time, repeat with the poet—

Among the woods I forced my way,
 Until at length I came to one dear nook
 Unvisited, where not a broken bough
 Drooped with its withered leaves, ungracious sign
 Of devastation, but the *hazels* rose
 Tall and erect, with milk-white clusters hung,
 A virgin scene. WORDSWORTH¹.

Towards the end of September the leaves of trees begin to put on their autumnal dress. Mr. Stillingfleet remarks, that, about the 25th, the leaves of the plane tree were tawny; of the hazel, yellow; of the oak, yellowish green; of the sycamore, dirty brown; of the maple according to the soil and season, every hue, from pale yellow to a deep red and orange; of the ash, a fine lemon colour; of the elm, orange; of the hawthorn, tawny yellow; of the cherry, red; of the hornbeam, bright yellow; of the willow, still hoary. Yet, many of these tints cannot be considered complete, in some seasons, till the middle or latter end of October.

In this month particularly may it be said, with the poet,

With starry splendour on the hawthorn bough
 And graceful wild-rose, shines the *copious dew*;
 That precious lymph of Nature, which dilates

¹ See T. T. for 1815, p. 271, for a beautiful poem by Mr. Park, called '*The Filberd-Tree*.'

The ruby lip of ev'ry infant bud,
And lavish on the level turf remains
In silver beauty.

There is not a phenomenon of nature more common, or more beautiful, than that of dew ; those drops which,

With the earliest morn, the Sun
Impearls on every leaf and every flower.

The great benefit of dews in the refreshment of the earth and the nourishment of plants, is too well known to be dilated upon in this place : we shall, therefore, confine ourselves to a notice of the most recent and plausible *theory* of this useful phenomenon, as stated by Dr. Wells, in his 'Essay on Dew,' published in 1814. Mr. Wilson and Mr. Six thought the formation of dew was accompanied by the evolution of cold ; and this opinion was once held by Dr. Wells. But subsequent observations led him to question its accuracy ; and he was not long after enabled to ascertain, by direct experiment, that the temperature of bodies *sinks* before any dew is deposited on them ; and that the subsequent deposition of dew is the consequence of this coldness. This philosopher infers, therefore, that the deposition of dew has precisely the same cause on the appearance of moisture on the outside of a glass, or metallic vessel, when a liquor considerably colder than the air has been shortly before poured into it.

All bodies have the property of radiating heat. During the day, the heat lost by radiation is more than supplied by the solar heat ; so that the temperature of bodies is increased during the day, instead of being diminished. But, during the night, the heat radiated by the bodies on the surface of the earth penetrates into the sky, and does not again return to them. Hence their temperature must be constantly diminishing from radiation, and they will become and continue colder than the air during the whole night ; thus being in the state for the deposition of

dew upon their surfaces. This, however, will only happen when the sky is clear, and the atmosphere calm. If the sky be covered with clouds, they will radiate back nearly as much heat as they receive; and thus prevent the terrestrial bodies from cooling considerably. And, in windy nights, the agitation of the atmosphere compensates for its bad conducting power, and thus prevents that rapid lowering of temperature requisite to the production of dew.

Upon these and analogous principles, Dr. Wells accounts for the various phenomena of dew, as well as several other appearances which he attributes to similar causes: for these, however, the inquisitive reader must turn to the Essay itself. See also the '*Contemplative Philosopher*,' Vol. I, No. xxiii, on Dew.

As the various tribes of flowers decay, our attention is taken off from these elegant ornaments of nature, and transferred to those more humble, but not less interesting productions, herbs and plants.

Herbs too she knew, and well of each could speak
That in her garden sipped the silvery dew;
Where no vain flower disclosed a gaudy streak;
But herbs for use, and physic, not a few,
Of grey renown, within those borders grew:
The tufted *basil*, pun-provoking *thyme*,
Fresh *baum*, and *marigold* of cheerful hue:
The lowly *gill*, that never dares to climb;
And more I fain would sing, disdaining here to rhyme.

Yet *euphrasy* may not be left unsung,
That gives dim eyes to wander leagues around;
And pungent *radish*, biting infant's tongue;
And *plantain* ribbed, that heals the reaper's wound;
And *marjoram* sweet, in shepherd's posie found;
And *lavender*, whose spikes of azure bloom
Shall be, erewhile, in arid bundles bound,
To lurk amidst the labours of her loom,
And crown her kerchiefs clean with mickle rare perfume.

And here trim *rosemarine*, that whilom crowned
The daintiest garden of the proudest peer;
Ere, driven from its envied site, it found

A sacred shelter for its branches here ;
 Where edged with gold its glittering skirts appear.
 Oh wassel days ! O customs meet and well !
 Ere this was banished from its lofty sphere :
 Simplicity then sought this humble cell,
 Nor ever would she more with thane and lordling dwell.

The Schoolmistress, by Shenstone.

When the harvest is gathered in by the farmer, and the gleaners have got all they can pick ' ear by ear,' then the herd, the sheep, pigs, and turkeys, take the ' stubble,' or, as it is sometimes called, the ' *stray*.' In the open fields, in some of the villages on the south-eastern side of Cambridgeshire, it is curious to see flocks of many scores, perhaps some hundreds, of turkeys. They are *kept* by a regular *herd*, and either lodged at their respective homes, or, if the herd has accommodation for them, they are lodged all together, and the dung is very valuable. They are kept till near Christmas, when they are fattened and sent to London ; when a poor man has been known to make a guinea apiece of his turkeys, in Leadenhall-market. Sometimes they are driven to London in large flocks, the same as geese.

The husbandman now prepares for seed-time ; and the fields are again ploughed up for the winter corn, rye, and wheat, which are sown in September and October. The entrances to bee-hives are straitened, to prevent the access of wasps and other pilferers.

In reference to the appearance of *partridges* in this month, and their destruction by the sportsman, noticed at pp. 270, 271, we introduce the following pathetic Poem of the humane Mr. PRATT.

THE PARTRIDGES ; AN ELEGY.

Written on the last Day of August.

Hard by yon copse, that skirts the flow'ry vale,
 As late I walked to taste the evening breeze,
 A plaintive murmur mingled in the gale,
 And notes of sorrow echoed through the trees.

Touched by the sound, I nearer drew;
But my rude step increased the cause of pain:
Soon o'er my head the *whirring Partridge* flew,
Alarmed; and with her flew an infant train.

But short th' excursion; for, unused to play,
Feebly the unfledged wings th' essay could make:
The parent, sheltered by the closing day,
Lodged her loved covey in a neighbouring brake.

Her cradling pinions there she amply spread,
And hushed th' affrighted family to rest;
But still the late alarm suggested dread,
And closer to their feath'ry friend they pressed.

She, wretched parent! doomed to various woe,
Felt all a mother's hope, a mother's care;
With grief foresaw the dawn's impending blow,
And, to avert it, thus preferred her prayer:

' O Thou! who e'en the *sparrow* doth befriend;
Whose providence protects the harmless *wren*;
Thou, GOD OF BIRDS! these innocents defend
From the vile sport of unrelenting men;

' For soon as dawn shall dapple yonder skies,
The *slaughtering gunner*, with the tube of fate,
While the dire dog the faithless stubble tries,
Shall persecute our tribe with annual hate.

' O may the Sun, unfanned by cooling gale,
Parch with unusual heat th' undewy ground;
So shall the *pointer's* wonted cunning fail,
So shall the *sportsman* leave my babes unfound.

' Then shall I fearless guide them to the mead;
Then shall I see with joy their plumage grow;
Then shall I see (fond thought) their future breed,
And every transport of a parent know.

' But if some victim must endure the dart,
And fate marks out that victim from my race,
Strike, strike the leaden vengeance through this heart!
Spare! spare my babes! and I the death embrace.'

PRATT.

OCTOBER.

THIS month was called *Domitianus* in the time of Domitian; but, after his death, by the decree of the Senate, it took the name of October, every one hating the name and memory of so detestable a tyrant. It was called *wyn-monat*, or wine-month, by the Saxons.

Remarkable Days.

1.—SAINT REMIGIUS.

REMIGIUS is styled the *French Apostle*. After he had held his bishopric seventy-four years, he died at ninety-six years of age, A.D. 535.

6.—SAINT FAITH.

This virgin martyr suffered death under Dacianus, about the year 290, the most cruel torments being inflicted upon her.

*6. 1806.—HENRY KIRKE WHITE DIED.

Unhappy WHITE ! while life was in its spring,
And thy young Muse just waved her joyous wing,
The spoiler came ; and all thy promise fair
Has sought the grave, to sleep for ever there.
Oh ! what a noble heart was here undone,
When *Science* 'self destroyed her favourite son !
Yes ! she too much indulged thy fond pursuit,
She sowed the seeds, but Death has reaped the fruit.
'Twas thine own genius gave the final blow,
And helped to plant the wound that laid thee low :
So the struck EAGLE, stretched upon the plain,
No more through rolling clouds to soar again,
Viewed his *own feather* on the fatal dart,
And winged the shaft that quivered in his heart :
Keen were his pangs, but keener far to feel ;
He nursed the pinion which impelled the steel,

While the same plumage that had warmed his nest
Drank the last life-drop of his bleeding breast¹.

9.—SAINT DENYS.

St. Denys, or Dionysius, the Areopagite, was converted to Christianity by Saint Paul. The French say, that he was the first that preached the Gospel among them, and, for that reason, consider him their tutelar saint.

13.—TRANSLATION OF KING EDWARD THE
CONFESSOR.

He was the youngest son of King Ethelred ; but as all his elder brothers were either dead, or had fled away, he succeeded to the crown of England in the year 1042. He collected all the most useful laws made by the Saxon and Danish kings. The additional title of Confessor was probably given him by the pope, for settling what was then called *Rome-Scot*, but now better known by the name of *Peter's Pence*.—See T. T. for 1815, p. 281.

*14. 1806.—BATTLE OF JENA.

*15. 1815.—MURAT SHOT.

And thou, too, of the snow-white plume!
Whose realm refused thee even a tomb²;
Better hadst thou still been leading
France o'er hosts of hirelings bleeding,
Than sold thyself to death and shame
For a meanly royal name;
Such as he of Naples wears,
Who thy blood-bought title bears.—
Little didst thou deem when dashing
On thy war-horse through the ranks,
Like a stream which bursts its banks,
While helmets cleft and sabres clashing
Shone and shivered fast around thee—
Of the fate at last which found thee !

¹ See the suppressed poem, entitled *English Bards and Scotch Reviewers*, by Lord Byron, p. 64.

² Murat's remains were torn from the grave, and afterwards burnt.

Was that haughty plume laid low
 By a slave's dishonest blow?
 Once it onward bore the brave,
 Like foam upon the highest wave.—
 There, where death's brief pang was quickest,
 And the battle's wreck lay thickest,
 Strewed beneath the advancing banner
 Of the *Eagle's* burning crest—
 (There with thunder-clouds to fan her,
 Who could then her wing arrest—
 Victory beaming from her breast?)
 While the broken line enlarging
 Fell or fled along the plain;
 There be sure was MURAT charging;
 There he ne'er shall charge again!

BYRON.

*16. 1586.—SIR PHILIP SIDNEY DIED.

But if (fie of such a *But!*) you be born so near the dull-making cataract of Nilus, that you cannot bear the planet-like musick of *Poetry*; if you have so earth-creeping a mind, that it cannot lift itself up to look to the *sky of Poetry*, or, rather, by a certain rustical disdain will become such a Mome, as to be a Momus of Poetry: Then, though I will not wish unto you the ass's ears of *Midas*, nor to be driven by a poet's verses as Bubonax was, to hang himself; nor to be rhymed to death, as is said to be done in *Ireland*; yet thus much curse I must lend you, in behalf of all *Poets*, That while you live, you live in love, and never get favour for lacking skill of a sonnet; and when you die, your memory die from the earth for want of an epitaph.—*Defense of Poery.*

SIDNEY, than whom no gentler, braver man,
 His own delightful genius ever feigned,
 Illustrating the vales of Arcady
 With courteous courage, and with loyal loves.

SOUTHEY.

17.—SAINT ETHELDREDA.

She was a princess of distinguished piety, daughter of Anna, King of the East-Angles, and Herewitha his queen, and was born about the year 630,

at Ixning, a small village in Suffolk. In the year 673, she founded the conventual church of Ely, with the adjoining convent. Of this monastery she was constituted abbess, the monks and nuns living in society and regular order : it flourished for nearly two hundred years, but was destroyed, with its inhabitants, by the Danes, in 870.

18.—SAINT LUKE THE EVANGELIST.

Luke was born at Antioch, the metropolis of Syria, a place celebrated for the study of the liberal arts. The notion that he was a painter is without foundation, as it is not countenanced by antient writers. Dr. Lardner thinks that he might have been by profession a physician, as the expression ‘ beloved physician,’ *Col. iv, 14*, seems to intimate. Luke lived a single life, and died in the eighty-fourth year of his age, about the year of Christ 70; probably a natural death.

25.—ACCESSION OF KING GEORGE III.

Upon the death of George II, his present Majesty came to the throne, on the 22d of September 1760.

25.—SAINT CRISPIN.

Two brothers, Crispinus and Crispianus, were born at Rome; whence they travelled to Soissons in France, about the year 303, to propagate the Christian religion. Being desirous, however, of rendering themselves independent, they gained a subsistence by shoe-making. It having been discovered that they privately embraced the Christian faith, and endeavoured to make proselytes of the inhabitants, the governor of the town immediately ordered them to be beheaded, about the year 308. From this time, the shoe-makers chose them for their tutelar saints.—For a curious anecdote relative to this day, see our last volume, p. 291-293.

26.—PROCLAMATION OF KING GEORGE III.

His present Majesty was proclaimed King on the 26th of October 1760, the day after his accession to the throne.

*26. 1764.—HOGARTH DIED.

The hand of him here torpid lies
That drew th' essential form of grace;
Here closed in death th' attentive eyes,
That saw the manners in the face. JOHNSON.

Epitaph at Chiswick.

FAREWEL, great painter of mankind,
Who reached the noblest point of art;
Whose pictured morals charm the mind,
And through the eye correct the heart!
If *genius* fire thee, reader, stay;
If *nature* touch thee, drop a tear:
If neither move thee, turn away,
For HOGARTH's honoured dust lies here.

GARRICK.

28.—SAINT SIMON AND SAINT JUDE, *Apostles*.

Simon is called the *Canaanite*, from the Hebrew word *Cana*, to be zealous: hence his name of *Simon Zelotes*, or the Zealot. After enduring various troubles and afflictions, he, with great cheerfulness, suffered death on the cross.

Jude was of our Lord's kindred; '*Is not his mother called Mary, and his brethren James and Joses, and Simon and Judas?*' Matt. xiii, 55. After great success in his apostolic ministry, he was, at last, for a free and open reproof of the superstitious rites of the Magi, cruelly put to death. He has left one epistle of universal concern to Christians.

*29. 1618.—SIR WALTER RALEIGH BEHEADED.

Written the Night before his Death.

Even such is time, that takes on trust
Our youth, our joys, our all we have,
And pays us but with age and dust;
Who in the dark and silent grave,

(When we have wandered all our ways)
Shuts up the story of our days;
But from this earth, this grave, this dust,
My God shall raise me up, I trust.

*—1751.—R. B. SHERIDAN BORN.

* * * *

The orator—dramatist—minstrel—who ran
Through each mode of the lyre, and was master of ALL!
Whose mind was an essence, compounded with art,
From the finest and best of all other men's powers;—
Who ruled, like a wizard, *the world of the heart*,
And could call up its SUNSHINE, or bring down its SHOWERS!
Whose humour, as gay as the fire-fly's light,
Played round every subject, and shone as it played;—
Whose wit in the combat, as gentle as bright,
Ne'er carried a heart-stain away on its blade;—
Whose ELOQUENCE—bright'ning whatever it tried,
Whether reason or fancy, the gay or the grave,—
Was as rapid, as deep, and as brilliant a tide,
As ever bore Freedom aloft on its wave!

Astronomical Occurrences

IN OCTOBER 1817.

THE Sun enters Scorpio at 34 m. past 6 in the evening of the 23d of this month; and the time of his rising and setting is shown in the following

TABLE

For every fifth Day of the Month.

Wednesday, Oct. 1st,	Sun rises 12 m. after 6.	Sets 48 m. past 5
Monday, . . . 6th,	. . . 22 . . . 6 . 38 . . . 5	
Saturday, . . . 11th,	. . . 32 . . . 6 . 28 . . . 5	
Thursday, . . . 16th,	. . . 42 . . . 6 . 18 . . . 5	
Tuesday, . . . 21st,	. . . 52 . . . 6 . 8 . . . 5	
Sunday, . . . 26th,	. . . 1 . . . 6 . 59 . . . 5	
Friday, . . . 31st,	. . . 11 . . . 7 . 49 . . . 4	

* From Lines 'On the Death of ———,' which appeared in the Morning Chronicle for August 5, 1816, and were attributed to a celebrated poet of the day.

The following Table shows what is to be subtracted from the apparent time, in order to obtain true time.

TABLE
Of the Equation of Time for every fifth Day of the Month.

	m.	s.
Oct. 1st, from the time on the dial subtract	10	18
6th,	11	49
11th,	13	10
16th,	14	19
21st,	15	14
26th,	15	53
31st,	16	13

The Moon enters her last quarter at 42 m. after 2 in the afternoon of the 3d; there will be a new Moon at $\frac{1}{4}$ past 4 in the afternoon of the 10th; she will commence her first quarter at 44 m. past 7 in the morning of the 17th; and the Moon will be full at 55 m. after 2 in the morning of the 25th. The Moon may also be seen on the meridian of the Royal Observatory at the following times during the present month:

October 2d,	at 57 m. after	4 in the morning
3d,	49	5
16th,	45	5 in the evening.
17th,	43	6
18th,	37	7
19th,	26	8
20th,	12	9
21st,	55	9
22d,	36	10
23d,	17	11

The Moon will be in conjunction with α in Libra at 56 m. past 9 in the morning of the 12th. Mercury and Spica Virginis will be in conjunction on the 5th, when the star will be $50\frac{1}{4}$ north of the planet. Mercury will also be in his inferior conjunction at $\frac{1}{4}$ past 5 in the morning of the 10th; and he will appear stationary on the 18th.

None of the eclipses of Jupiter's first or second satellite will be visible this month at the Royal Ob-

servatory, and only one of the third satellite ; when the emersion will take place at 18 m. after 9 in the evening of the 23d.

ON THE CALCULATION OF ECLIPSES.

[Continued from p. 266.]

IN the preceding part of this article, we have considered only the pure shadow ; but the partial interruption of the solar beams by the Earth, causes this to be surrounded by a sensible obscuration, denominated the *penumbra* ; the limits of which we shall now point out the method of determining.

Let AB' (fig. 7) be a tangent to the apposite limbs of the Sun and Moon ; MM' represents the orbit of the Moon ; the angle $M'EC$ will be the distance of the penumbra from the axis CE of the shadow. This angle being the exterior angle of the triangle $C'M'E$, it is equal to the sum of the two interior and opposite angles $EM'C'$ and $EC'M'$.

Now the first of these is the horizontal parallax of the Moon, and the second is equal to $C'AE + C'EA$; that is, the parallax of the Sun plus his semidiameter, as seen from the Earth ; consequently the angle CEM' , or the exterior radius of the penumbra, is equal to the sum of the parallaxes of the Sun and Moon added to the apparent semidiameter of the Sun.

Then, by subtracting the semidiameter of the pure shadow from this result, the breadth of the penumbra will be obtained. As we have shewn that this semidiameter is equal to the sum of the solar and lunar parallax, minus the apparent semidiameter of the Sun, it follows that the breadth of the penumbra is just equal to the apparent diameter of the Sun.

If it were required to calculate the extent of the penumbra projected by the Moon upon the Earth in eclipses of the Sun, according to the same principles, it would only be necessary to substitute in the preced-

ing considerations the given quantities relative to the Moon, instead of those which relate to the Earth. By this means the exterior radius of this penumbra will be equal to the sum of the parallaxes of the Sun and the Earth augmented by the apparent semidiameter of the Sun; these being all calculated for the Moon instead of the Earth. If we neglect the solar parallax, as being very small, the formula will be simplified, and the exterior radius of the lunar penumbra, seen from the Moon, becomes equal to the sum of the apparent semidiameters of the Sun and Moon, as seen from the Earth. To this sum there must be added $4''.54$, on account of the parallax of the Sun. The total breadth of the penumbra is therefore equal to the apparent diameter of the Sun seen from the Moon; that is, to the diameter as seen from the Earth, increased by $4''.54$, on account of the difference of distance.

Thus, if we denote the apparent diameter of the Sun as seen from the Earth by D , and that of the Moon by D' , also the solar and lunar parallaxes by p and p' ; then, from what precedes, we shall have the semidiameter of the lunar penumbra, as seen from the Moon, equal to

$$\frac{1}{2} (D' + D) \frac{p'}{p' - p};$$

and that of the lunar shadow, as seen from the same place, equal to

$$\frac{1}{2} (D' - D) \frac{p'}{p' - p};$$

and consequently, by subtracting the last of these values from the first, the breadth of the lunar penumbra will be equal to

$$\frac{D \cdot p'}{p' - p}.$$

In the case where the Sun is in apogee, and the Moon in perigee, we have $D = 1890''.96$, $p' = 3665''$,

and $p = 8''.62$; and consequently, by the substitution of these values,

$$\frac{D \cdot p'}{p' - p} = \frac{1890.96 \times 3665}{3665 - 8.62} = 1895''.5,$$

for the breadth of the lunar penumbra. The semidiameter of this penumbra, in the same case, is also

$$\begin{aligned} & \frac{(D' + D) p'}{2(p' - p)} \\ &= \frac{(2011''.392 + 1890''.96) \times 3665}{2(3665'' - 8''.62)} = 1955''.58. \end{aligned}$$

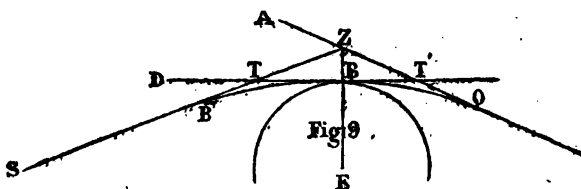
The apparent semidiameter of the Earth, as seen from the Moon, under the same circumstances, which is equal to the horizontal parallax of the Moon, is $= 3665''$; and consequently, in the most favourable positions of these bodies, the lunar penumbra covers only a little more than half the breadth of the terrestrial disc, and therefore only about one-fourth of its surface.

In the preceding inquiries, no regard has been paid to the refractions which the solar rays experience in their passage through the terrestrial atmosphere; but, as it is requisite to take these effects into the account, the following explanation will enable the reader to appreciate them.

When the effects of the atmosphere are not considered, the pure shadow is limited by two lines, which are tangential to the Sun and the Earth; but when the effects of the atmosphere are taken into the account, the limits are not the same. In this case, the luminous rays are bent out of their rectilineal course, both in passing through the atmosphere before they arrive at the Earth, and in traversing it after they have become tangents to that body, so as to cut the axis of the conical shadow much nearer the Earth than if they had preserved their rectilineal direction in all parts of their course, in the manner which we have supposed in the preceding researches. Thus, in fig. 7, the luminous ray AB, instead of

meeting EC, the axis of the conical shadow in C, would be refracted by the atmosphere, and caused to meet that line in O. The rays from the inferior parts of the Sun's surface would also meet this line in points situated between O and C; and therefore an observer situated beyond the point where a ray from the superior edge of the solar disc, forming a tangent to the upper surface of the Earth, would not be wholly in the shadow, but would perceive the disc of the Earth encompassed with a luminous ring, since he would see the circumference of the solar disc by refraction. The farther he is supposed to recede from the Earth in the line SEC, the broader the luminous ring would appear, until the whole disc of the Sun became visible.

The different limits of this shadow may easily be determined in the following manner. Let SB (fig. 9) be a ray proceeding from the solar disc at S, and touching the surface of the Earth at B. Then, if the Earth be considered as spherical, both parts of the curve described about this surface will be symmetrical; and if the direction be ST when it enters the atmosphere, and T'O when it leaves it, the angles BTZ and BT'Z, formed by these directions and the tangent TT', will be equal to each other. Now, the



angle BTZ, or DTS, is very nearly equal to DBS, or to the horizontal refraction, because the point Z is very little elevated above the point B; and the lines SZ and SB, drawn from these two points to the Sun, are very nearly parallel to each other¹. Thus

¹ This sensible parallelism is demonstrated by M. Biot, in Note 4 to Book I of his *Astronomie Physique*, 2d edit.

the angle $BT'Z$ is also very nearly equal to the horizontal refraction; and consequently the angle SZA , which expresses the inflexion of the ray, is equal to $BTZ + BT'Z$, or to double this refraction.

The effect of the atmosphere upon the solar rays may, therefore, be regarded as increasing the apparent diameter of the Sun by a quantity equal to double the horizontal refraction; for, when the rays have once quitted the atmosphere, they proceed in rectilinear directions, in the same manner as if they had been originally projected in those directions. The ray SBO in the above figure, for example, emanating from the superior edge of the true Sun S , arrives at O , as if it came from the upper limb of a fictitious Sun, the diameter of which exceeded the true one by a quantity equal to the angle AZS . Hence it is obvious that, in order to find the distance of the vertex of the pure shadow from the centre of the Earth, as affected by the refractive power of the atmosphere, it will be sufficient to increase the semidiameter of the Sun by a quantity equal to double the horizontal refraction, and then the preceding formulæ may be used for this case also; and, consequently, instead of having $\sin(\frac{1}{2}D - p)$ in the denominator, we shall have $\sin(\frac{1}{2}D + 2r - p)$.

If now, instead of supposing the ray to proceed from the exterior part of the solar disc, it be considered as emanating from any other point at a given distance from the centre, by substituting that distance for the semidiameter in the preceding formula, it will give the distance of the Earth at which that point will begin to appear; and therefore the zones that will successively become visible at each distance may be thus found.

From these calculations, astronomers conclude that an observer, situated at the surface of the Moon, even in the most favourable circumstances, would see three-fourths of the solar disc by refracted light, which had traversed the Earth's atmosphere; and this

is the reason why the Moon appears of such a red colour during a lunar eclipse. The light of the Moon would, therefore, appear much more brilliant at those times, if it were not for the absorbent power of the terrestrial atmosphere through which it passes.

From what has been shown in the former part of this article relative to the comparative breadths of the lunar shadow and the terrestrial disc, it is evident that total eclipses of the Sun can only be local and of short duration; while eclipses of the Moon are general for all parts of the terrestrial hemisphere which has the Moon above the horizon at the time of the eclipse; and that these, on account of the extent of the Earth's shadow, may often have a much greater duration than eclipses of the Sun, in which the total darkness can never exceed five minutes.

[To be continued next Month.]

The Naturalist's Diary.

Late does the SUN begin his shortened race,
Languid, although no cloud obscures the view;
The nipping *hoar-frost* veils the shrivelled grass,
Where waved, erewhile, the cool refreshing dew.

Cold from the north his hooked atoms calls,
And ev'ry field in firmer fetters binds;
Rustling in show'rs the *withered foliage* falls,
Slow from the tree, the sport of eddy winds.

The *birds*, all flocking from their summer haunts,
On the rough stubbles pick the costly grain;
His deadly snares the cruel *fowler* plants,
And intercepts the wing that flaps in vain.

Hard is their fate—if we may call it hard,
To shun the rigid winter's coming storms,
When famine threatens in the farmer's yard,
And drifted snow the desert field deforms.

The most familiar of all birds of song,
Domestic *redbreast*, on the window sits,
While, seldom seen, though whirring all day long,
The active *wren* from hedge to hedge still flits.

GREENE.

THE groves now lose their leafy honours ; but, before they are entirely tarnished, an adventitious beauty, arising from that gradual decay which loosens the withering leaf, gilds the autumnal landscape with a temporary splendour superior to the verdure of spring or the luxuriance of summer. The infinitely various and ever-changing hues of the leaves at this season, melting into every soft gradation of tint and shade, will long continue to engage the imitation of the painter, and the contemplation of the poet and the philosopher.

What pomp, what vast variety of hues,
The woodland scenes adorn ! The purple deep,
Orange, and opal, and carnation bright,
To the rapt eye their rich profusion spread.
Alas ! this splendour all bespeaks decay.
Such is the common lot. The north winds soon
Their sylvan spoils will strew along the vales.
The leaf incessant flutters to the ground,
And, flutt'ring, startles such, who musing stray,
Lonely and devious, through the solemn shades *.

DE LILLE.

Nature having perfected her seeds, her next care is to disperse them : the seed cannot answer its purpose while it remains confined in the capsule. After the seeds, therefore, are ripened, the pericarpium opens to let them out ; and the opening is not like an accidental bursting, but, for the most part, is according to a certain rule in each plant. Some seeds which are furnished with hooks or spines, attach themselves to the rough coats of animals, and thus promote their dispersion. Others are contained in berries, and, being swallowed by birds, are again committed, without injury, to the earth in various places.—See

* More changeful than the *falling leaf*
By the chill blast in *Autumn's* sapless reign,
Whirled from the tree, a sport to all its rage.

T. T. for 1814, p. 269, and T. T. for 1815; p. 296.

Hips, haws, sloes, and blackberries, now adorn our hedges; and the berries of the barberry (*berberis vulgaris*), bryony (*tamus communis*), honeysuckle, elder, holly, woody-nightshade, and privet (*ligustrum vulgare*), afford a valuable supply of food for many of the feathered race, while passing their winter with us.

About the middle of the month, the common martin disappears; and, shortly afterwards, the smallest kind of swallow, the sand-martin, migrates. The Royston or hooded crow (*corvus cornix*) arrives from Scotland and the northern parts of England, being driven thence by the severity of the season. It destroys lambs, and young partridges and moor fowl, and is almost as mischievous as the raven. The woodcock returns, and is found on our eastern coasts. Various kinds of *waterfowl* make their appearance; and, about the middle of the month, *wild geese* leave the fens, and go to the rye lands, to devour the young corn. *Rooks* sport and dive, in a playful manner, before they go to roost, congregating in large numbers. *Stares* assemble in the fen countries, in vast multitudes, and, perching on the reeds, render them unfit for thatching, and thus materially injure the property of the farmer.

The gleamy *gossamer* now spreads
Its filmy web-work o'er the tangled mead.

The ground is covered, about this time, with spiders' webs, crossing the path from shrub to shrub, and floating in the air. This *gossamer* appearance is thus noticed by Mr. White:—'On September 21, 1741, being then on a visit, and intent on field-diversions, I rose before daybreak: when I came into the enclosures, I found the stubbles and clover-grounds matted all over with a thick coat of cobweb, in the

meshes of which a copious and heavy dew hung so plentifully, that the whole face of the country seemed, as it were, covered with two or three setting-nets drawn one over another. When the dogs attempted to hunt, their eyes were so blinded and hoodwinked that they could not proceed, but were obliged to lie down and scrape the incumbrances from their faces with their fore-feet; so that, finding my sport interrupted, I returned home, musing in my mind on the oddness of the occurrence.

‘ As the morning advanced the sun became bright and warm, and the day turned out one of those most lovely ones which no season but the autumn produces; cloudless, calm, serene, and worthy of the south of France itself.

‘ About nine an appearance very unusual began to demand our attention, a shower of cobwebs falling from very elevated regions, and continuing, without any interruption, till the close of the day. These webs were not single filmy threads, floating in the air in all directions, but perfect flakes or rags; some near an inch broad, and five or six long, which fell with a degree of velocity that showed they were considerably heavier than the atmosphere.

‘ On every side, as the observer turned his eyes, might he behold a continual succession of fresh flakes falling into his sight, and twinkling like stars as they turned their sides towards the sun.

‘ How far this wonderful shower extended would be difficult to say; but we know that it reached Bradley, Selborne, and Alresford, three places which lie in a sort of a triangle, the shortest of whose sides is about eight miles in extent.

‘ At the second of those places there was a gentleman (for whose veracity and intelligent turn we have the greatest veneration), who observed it the moment he got abroad; but concluded that, as soon as he came upon the hill above his house, where he took his morning rides, he should be higher than this meteor,

which he imagined might have been blown, like *thistle-down*, from the common above: but, to his great astonishment, when he rode to the most elevated part of the down, three hundred feet above his fields, he found the webs, in appearance, still as much above him as before; still descending into sight in a constant succession, and twinkling in the sun, so as to draw the attention of the most incurious.

Neither before nor after was any such fall observed; but on this day the flakes hung in the trees and hedges so thick, that a diligent person sent out might have gathered baskets full.

The remark that I shall make on these cobweb-like appearances, called *gossummer*, is, that, strange and superstitious as the notions about them were formerly, nobody in these days doubts but that they are the real production of small spiders, which swarm in the fields in fine weather in autumn, and have a power of shooting out webs from their tails, so as to render themselves buoyant, and lighter than air. But why these apterous insects should *that day* take such a wonderful aërial excursion, and why their webs should at once become so gross and material as to be considerably more weighty than air, and to descend with precipitation, is a matter beyond my skill. If I might be allowed to hazard a supposition, I should imagine that those filmy threads, when first shot, might be entangled in the rising dew, and so drawn up, spiders and all, by a brisk evaporation into the regions where clouds are formed: and if the spiders have a power of coiling and thickening their webs in the air, as Dr. Lister says they have [see his Letters to Mr. Ray], then, when they were become heavier than the air, they must fall.

Every day in fine weather, in autumn chiefly, do I see those spiders shooting out their webs and mounting aloft: they will go off from your finger if you will take them into your hand. Last summer one alighted on my book as I was reading in the parlour; and,

running to the top of the page, and shooting out a web, took its departure from thence. But what I most wondered at was, that it went off with considerable velocity in a place where no air was stirring; and I am sure that I did not assist it with my breath. So that these little crawlers seem to have, while mounting, some locomotive power without the use of wings, and to move in the air faster than the air itself.'—*Natural Hist. of Selborne*, vol. i, p. 323-327.

When the garden-spider (*aranea horticola*) is desirous of flitting from one place to another, this animal fixes one end of a thread to the place where she stands, and then with her hind paws draws out several other threads from the nipples, which, being lengthened out and driven by the wind to some neighbouring tree, or other object, are, by their natural clamminess, fixed to it. When she finds that these are fastened, she makes of them a bridge, on which she can pass or repass at pleasure. This done, she renders the thread still thicker, by spinning others to it. From this thread she often descends, by spinning downward to the ground. The thread formed by the latter operation she fixes to some stone, plant, or other substance. She re-ascends to the first thread, and at a little distance from the second begins a third, which she fixes in the same manner. She now strengthens all the three threads, and, beginning at one of the corners, weaves across, and at last forms a strong and durable net, in the centre of which she places herself, with her head downward, to wait for her prey¹.

Her disembowelled web she spreads
 Obvious to *vagrant flies*: she secret stands
 Within her woven cell; the humming prey,
 Regardless of their fate, rush on the toils
 Inextricable, nor will aught avail
 Their arts, or arms, or shapes of lovely hue;
 The *wasp* insidious, and the buzzing *drone*,

¹ For some very curious particulars respecting the web of the spider, see our last volume, pp. 305-307.

And *butterfly* proud of expanded wings
 Distinct with gold, entangled in her snares,
 Useless resistance make: with eager strides
 She tow'ring flies to her expected spoils;
 Then with envenomed jaws the vital blood
 Drinks of reluctant foes, and to her cave
 Their bulky carcasses triumphant drags.

PHILIPS.

Among the *flowers* which are still usually in blow, in this month, is the holy-oak, Michaelmas daisy, stocks, nasturtian, marigold, mignonette, lavender, wall-flower, red hips, china rose, virginia stock, heart's-ease, laurustinus, rocket, St. John's wort, periwinkle, &c. The hedges are now ornamented with the wreaths and festoons of the scarlet berries of the black briony; and now and then, that last 'pale promise of the waning year,' the *wild rose*, meets the eye—born, just to bloom and die. '*But so I have seen a ROSE newly springing from the clefts of its hood, and at first it was fair as the morning, and full with the dew of heaven as a lamb's fleece; but when a ruder breath had forced open its virgin modesty, and dismantled its too youthful and unripe retirements, it began to put on darkness, and to decline to softness and the symptoms of a sickly age; it bowed the head, and broke its stalk; and, at night, having lost some of its leaves, and all its beauty, it fell into the portion of weeds and outworn faces.*'—JEREMY TAYLOR¹.

¹ The beautiful and well known lines of Cowper, '*The rose had been washed, just washed in a shower,*' are written in a kindred spirit, and are almost equally touching with the above quotation from the eloquent Bishop Taylor. The following fragment of *Sappho* is of another cast:

Would Jove appoint some flower to reign
 In matchless beauty on the plain,
 The rose (mankind will all agree)
 The rose the queen of flowers should be,
 The pride of plants, the grace of bowers,
 The blush of meads, the eye of flowers:

As flowers now decay, and the bees cannot procure any farther support, this is the season for taking the honey. To obtain this precious article, the industrious collectors are destroyed with the fumes of burning brimstone. Various methods have been proposed to save the lives of the bees; but they are found so materially to reduce the profits of the owners, that it will be long before they are generally adopted¹.

ELEGY to the BEE.

Sweet Labourer! 'midst the *Summer's* golden hour,
Full oft I trace thy little busy flight;
With pleasure see thee perch from flow'r to flow'r,
On *violets, woodbines, roses, lilies, light!*

Yet what to thee is *Summer's* golden smile?
And what to thee the flow'r-enamelled plain?
Will *gratitude* reward thy daily toil?
No, no, thou workest for reward in vain!

Not long the hive of treasure will be thine,
Rapacity will force thy little door;
Those treasures with thy life must thou resign,
A breathless victim on the fragrant store!

DR. WILCOTT.

The taking of wild-fowl commences, by Act of Parliament, on the 1st of October, and the decoy-business is at the greatest height about the end of the month. Great numbers of wild ducks and other waterfowl are annually caught in the extensive marsh lands of Lincolnshire in this way.—See T. T. for 1814, p. 275.

The weather in October is peculiarly favourable to

Its beauties charm the gods above;
Its fragrance is the breath of love;
Its foliage wantons in the air
Luxuriant, like the flowing hair:
It shines in blooming splendour gay,
While zephyrs on its bosom play.

FAWKES.

¹ See, however, *Mr. Huish's* description of his newly-invented hive, by which he is enabled to deprive the bees of their honey without losing a single bee.—*Treatise on Bees*, p. 98, et seq.

the sports of the field ; and hunting is now at its height, as little damage is committed on the farmer's grounds after the gathering of the harvest.

See ! from the brake the whirring *pheasant* springs,
And mounts exulting on triumphant wings ;
Short is his joy ; he feels the fiery wound,
Flutters in blood, and, panting, beats the ground.
Ah ! what avails his glossy, varying dyes ;
His purple crest, his scarlet-circled eyes !
The vivid green his shining plumes infold,
His painted wings and breast that flames with gold !

POPE.

The principal harvest of *apples* is about the beginning of this month ; and the counties of *Herefordshire*, *Worcestershire*, *Somersetshire*, and *Devonshire*, are busily employed in the making of *cider* and *perry*. *Herefordshire* is particularly famous as a cider country. The apple and pear trees, which form the orchards of *Herefordshire*, are composed of a variety of the *pyrus malus*, or crab ; and the *pyrus communis*, or common wild pear. The native wild crab is subject to considerable diversity in the appearance of its leaves, and in the colour, shape, and flavour of its fruit : by selecting and cultivating the best of these, all our valuable varieties have been produced. Several of these artificial varieties have been brought from *Normandy*, and other parts of the continent.

In the management of the fruit, and subsequent *manufacture* of *cider*, considerable variations occur, according as the makers are more or less skilful. Independently of the qualities of the apple, the superior flavour and richness of the liquor greatly depend on the judicious nature of the operations. The juice of the *pulp* alone is inadequate to make a good and generous *cider* ; the qualities of the *kernel* are wanting to add flavour, and those of the *rind* to give colour ; and hence it is necessary that the juices of both these should be perfectly expressed. The apples should also be properly separated when gathered.

Pressed from th' exub'rant orchard's fruitful bound,
 Pomona pours a sparkling tide, that vies
 With the rich juices of the purple vine;
 Lo! russet Labour's busy train, both old
 And young, shake numerous down the mellow fruit,
 Streaked with a cheek as ruddy as their own.

Ciders manufactured from good fruit will retain a considerable proportion of their sweetness at the end of three or four years; but it is then gradually dissipated. The best time for *bottling cider* is, when it is from eighteen months to two years old; or, more properly, when it has acquired its highest brightness and flavour in the cask. When bottled in this state, it may be kept to almost any age, if the bottle be perfectly *air-tight*. The best time for bottling is in cool weather, as it is then less likely again to ferment. In making cider for the common drink of the farmhouse, the *flavour* is but little attended to, the great object being to obtain a large quantity at a small expense.

The manufacture of the delicious *perry* differs little from that of cider; and it is made in great quantities in all the cider countries. The *squash pear*, so called from the tenderness of its pulp, has probably furnished England with more *Champaigne* than was ever imported into it. Cider, perry, and very excellent gooseberry wine, resemble somewhat in flavour the sparkling beverage of our continental neighbours¹. Though the 'luscious grape' be denied to our variable climate, yet, besides the apple and the pear,

¹ Some ciders have by art or age unlearned
 Their genuine relish, and of sundry vines
 Assumed the flavour: one sort counterfeits
 The *Spanish* product; this to *Gauls* has seemed
 The sparkling nectar of *Champaigne*; with that
 A *German* oft' has swilled his throat, and sworn,
 Deluded, that imperial *Rhine* bestowed
 The gen'rous rummer; whilst the owner, pleased,
 Laughs inly at his guests thus entertained
 With foreign vintage from his cider cask.

On our account has God,
 Indulgent to all moons, some succulent plant
 Allotted, that poor helpless man might slake
 His present thirst, and matter find for toil.
 Now will the *corinths*, now the *rasps*, supply
 Delicious draughts: the *quinces* now, or *plums*
 Or *cherries*, or the fair *Thisbeian* fruit,
 Are pressed to wines: the Britons squeeze the works
 Of sed'lous *bees*, and, mixing odorous herbs,
 Prepare balsamic cups, to wheezing lungs
 Medicinal and short-breathed antient sires.

But if thou'rt indefatigably bent
 To toil, and omnifarious drinks wouldst brew,
 Besides the Orchat ev'ry hedge and bush
 Affords assistance; ev'n afflictive *birch*,
 Cursed by unlettered idle youth, distils
 A limpid current from her wounded bark
 Profuse of nursing sap. When solar beams
 Parch thirsty human veins, the damasked meads,
 Unforced, display ten thousand painted flow'rs
 Useful in potables. Thy little sons
 Permit to range the pastures; gladly they
 Will mow the *cowslip* posies faintly sweet,
 From whence thou artificial wines shalt drain
 Of icy taste, that in mid fervours best
 Slake craving thirst, and mitigate the day.

PHILIPS,

The principal markets for the fruit liquors of Herefordshire and Worcestershire, are London and Bristol, from which ports great quantities are sent to the East and West Indies, and to other foreign markets, in bottles. The principal part of the liquors is brought immediately from the press by the country dealers who live within the district, and, in general, prefer to have it in that state, that the fermentation and subsequent management may take place under their own inspection. The price of the common cider is generally fixed by a meeting of the dealers at Hereford Fair, on the 20th of October annually, and, on the average of years, varies from 1*l.* 5*s.* to 2*l.* 2*s.* per hogshead. The *stire* cider is seldom sold from the press; the dealers either buy the fruit, or the growers work their own liquor: its

value, even at the press, is from 5*l.* to 15*l.* per hogshead.

Stirom, firmest fruit,
 Embottled long as Priameian Troy
 Withstood the Greeks, endures ere justly mild :
 Softened by age, it youthful vigour gains.
 Fallacious drink ! Ye honest men ! beware,
 Nor trust its smoothness ; the third circling glass
 Suffices virtue.

PHILIPS.

The annual produce of the fruit greatly varies ; in a plentiful year it is almost beyond conception, as the trees are then loaded even to excess, and frequently break under the weight of the apples : at these times, indeed, the branches are generally obliged to be supported on props, or forked poles. This kind of excessive fruitage, however, seldom occurs more than once in four years ; and at this time, twenty hogsheads of cider have been made from the produce of a single acre of orchard ground ¹.

October is also the great month for brewing beer,—whence the name applied to very strong beer, of OLD OCTOBER.

Laughing *ale* brewed in planetary hour,
 When March weighed night and day in equal scale :
 Or in *October* tunned, and mellow grown
 With seven revolving suns, the racy juice,
 Strong with delicious flavour, strikes the sense.

In this month is the great *potato* harvest, a root introduced into this country in the time of Queen Elizabeth, and for many years known only as a luxury at the tables of the rich ; but now grown in vast quantities as the food of both man and beast : and the most generally favourite aliment, perhaps, next to wheat. Such is the fluctuation of price in an article,

¹ See further in the ' Beauties of England and Wales,' vol. vi, p. 410-425 ; Marshall's Rural Economy of Gloucestershire, vol. ii ; and Philips's admirable Poem of '*Cider*.'

according to the season and scarcity, that the same root which in June sold for several shillings per quart, now sells as low, sometimes, as sixpence a *bushel*. Those who wish to taste the potato in the greatest perfection, must pay a visit to a sister country, where this useful vegetable is much larger and finer than in England, and is cooked in a very superior manner. It is produced in such abundance in Ireland, as to form, with butter-milk, the almost only food of the lower classes.

The sowing of wheat is generally completed in this month: when the weather is too wet for this occupation, the farmer ploughs up the stubble fields for winter fallows. Acorns are sown at this season, and the *planting* of *forest* and *fruit* trees takes place.

The prudent will observe what passions reign
In various plants (for not a man alone,
But all the wide creation Nature gave
Love and aversion). Everlasting hate
The *vine* to *ivy* bears, nor less abhors
The *colewort's* rankness, but with am'rous twine
Clasps the tall *elm*. The *Pæstan rose* unfolds
Her bud more lovely near the fetid *leek*,
(Crest of stout Britons), and enhances thence
The price of her celestial scent. The *gourd*
And thirsty *cucumber*, when they perceive
Th' approaching *olive*, with resentment fly
Her fatty fibres, and with tendrils creep
Diverse, detesting contact; whilst the *fig*
Contemns not *rue* nor *sage's* humble leaf
Close neighbouring. The Herefordian plant
Caresses freely the contiguous *peach*,
Hazel, and weight-resisting *palm*, and likes
T' approach the *quince*, and th' *elder's* pithy stem,
Uneasy seated by funereal *yew*
Or *walnut* (whose malignant touch impairs
All gen'rous fruits), or near the bitter dews
Of *cherries*: therefore weigh the habits well
Of plants, how they associate best, nor let
Ill neighbourhood corrupt thy hopeful plants.

PHILIPS.

NOVEMBER.

THE Saxons called November *wint-monat*, or wind-month, on account of the prevalence of high winds in this month.

Remarkable Days.

1.—ALL SAINTS.

IN the early ages of Christianity the word *saint* was applied to all *believers*, as is evident in the use of it by Saint Paul and Saint Luke ; but the term was afterwards restricted to such as excelled in Christian virtues. In the Romish church, holy persons, canonized by the Pope, are called *saints*, and are invoked and supplicated by the professors of that religion. For some rural customs on this day, see T. T. for 1814, pp. 278-9.

2.—ALL SOULS.

In Catholic countries, on the eve and day of All Souls, the churches are hung with black ; the tombs are opened ; a coffin covered with black, and surrounded with wax lights, is placed in the nave of the church, and, in one corner, figures in wood, representing the souls of the deceased, are halfway plunged into the flames.

*3. 1787.—BISHOP LOWTH DIED.

EPITAPH on his DAUGHTER.

Cara, VALE ! ingenio præstans, pietate, pudore,

Et plusquam natæ nomine, cara, VALE !

Cara Maria, VALE ! at veniet felicius ævum,

Quando iterum tecum, sim modo dignus, ero.

Cara REDI, lætâ tum dicam voce, paternos

Eja age in amplexus, cara Maria, REDI.

5.—KING WILLIAM LANDED.

The glorious revolution of 1688 is commemorated on this day ; when the throne of England became

vested in the illustrious House of Orange. Although King William landed on the 5th of November, the almanacks still continue the mistake of marking it as the *fourth*.

5.—POWDER PLOT.

This day is kept to commemorate the diabolical attempt of the Papists to blow up the Parliament House. The best account of this nefarious transaction is detailed in Hume's History of England, vol. vi, pp. 33-38, 8vo edition, 1802.

6.—SAINT LEONARD.

Leonard, or *Lienard*, was a French nobleman of great reputation in the court of Clovis I. He died about the year 559, and has always been implored by prisoners as their guardian saint.

*7. 1665.—FIRST ENGLISH GAZETTE:

*8. 1674.—MILTON DIED,

On the late MASSACRE in PIEMONTE¹.

Avenge, O Lord, thy slaughtered saints, whose bones
Lie scattered on the Alpine mountains cold;
Even them who kept thy truth so pure of old,
When all our fathers worshipt stocks and stones,
Forget not: in thy book record their groans
Who were thy sheep, and in their antient fold
Slain by the bloody Piemontese that rolled
Mother with infant down the rocks. Their moans

¹ In 1655, the Duke of Savoy determined to compel his reformed subjects, in the vallies of Piedmont, to embrace popery, or quit their country. All who remained and refused to be converted, with their wives and children, suffered a most barbarous massacre. Those who escaped, fled into the mountains, from whence they sent agents into England to CROMWELL for relief. He instantly commanded a general fast, and promoted a national contribution, in which nearly *forty thousand pounds* were collected. The persecution was suspended, the duke recalled his army, and the surviving inhabitants of the Piedmontese vallies were reinstated in their cottages, and the peaceable exercise of their religion. On this business, there are several state-letters in Cromwell's name written by Milton.—See these Letters translated, and more on this interesting subject, in *Jones's History of the Waldenses*, vol. ii, p. 342, et seq.

The vales redoubled to the hills, and they
 To Heaven. Their martyred blood and ashes sow
 O'er all the Italian fields, where still doth sway
 The triple Tyrant ; that from these may grow
 A hundred fold, who, having learned thy way,
 Early may fly the Babylonian woe.

9.—LORD MAYOR'S DAY.

The word *mayor*, if we adopt the etymology of Verstegan, comes from the antient English *maier*, able or potent, of the verb *may* or *can*. King Richard I, A.D. 1189, first changed the bailiffs of London into Mayors ; by whose example, others were afterwards appointed. The power of the Lord Mayor is very extensive ; for he is not only the King's Representative in the civil government of the city, but also First Commissioner of the Lieutenancy ; Perpetual Coroner and Escheator within the city and its liberties, and in the Borough of Southwark ; Chief Justice of Oyer and Terminer, and gaol delivery of Newgate ; Judge of the Courts of Wardmote at the election of aldermen ; Conservator of the rivers Thames and Medway ; Perpetual Commissioner in all affairs relating to the river Lea ; and Chief Butler to the King at all coronations. No corporation business is valid without his authority ; and no election of a mayor for the ensuing year is legal without his presence, he being living.

Although the office of the Lord Mayor be elective, yet his supremacy does not cease even on the death of the sovereign ; and when this happens, ' he is considered as the principal officer in the kingdom, and takes his place accordingly in the Privy-council, until the new king be proclaimed.'

The convivial preparations for the celebration of Lord Mayor's Day, in London, are upon a very large scale :—

Countless turbot and unnumbered soles
 Fill the wide kitchens of each livery hall :
 From pot to spit, to kettle, stew, and pan,

The busy hum of greasy scullions sounds,
 That the fixed *beadles* do almost perceive
 The secret dainties of each other's watch :
Fire answers *fire*, and thro' their paly flames
 Each table sees the other's bill of fare :
Cook threatens *cook* in high and saucy vaunt
 Of rare and new-made dishes ; *confectioners*
 (Both *pastry-cooks* and *fruiterers* in league)
 With candied art their rivets closing up,
 Give pleasing notice of a rich *dessert*.

The order of the *procession* is well described in the following parody of a speech in Shakspeare's Henry V :—

Suppose that you have seen
 The new-appointed MAYOR at QUEEN-STAIRS¹
 Embark his royalty : his own company
 With silken streamers the young gazers pleasing,
 Painted with different fancies ;—have beheld
 Upon the golden galleries music playing,
 And the horns echo, which do take the lead
 Of other sounds :—now view the *city-barge*
 Draw its huge bottom thro' the furrowed *Thames*,
 Breasting the adverse surge : O do but think
 You stand in TEMPLE-GARDENS, and behold
 London herself, on her proud stream afloat,
 For so appears this fleet of Magistracy
 Holding due course to WESTMINSTER.

Here the Lord Mayor lands, and proceeds to the Exchequer to be sworn ; after this, he returns by water, and disembarks at Blackfriars. The cavalcade advances to Guildhall amidst admiring crowds of citizens, their wives, and children. Meanwhile, in Guildhall,

Common Council in their mazarine gowns
 Sit patiently², and *inly ruminate*
 The dinner's luxury : invited *Courtiers*,
 Garter-invested *Peers*, and grave *Judges*,

¹ Three Cranes' Wharf, at the bottom of Queen-street, Cheapside, at which place the Lord Mayor used to take water. This place has been abandoned for Blackfriars, for some years past.

² From three o'clock, when the doors are opened, till half-past six.

Present them to the gazing company
 So many honoured guests: and now behold
 The LORD MAYOR entering with the Aldermen;—
*From side to side he greets them all in turn,
 Bids them fair welcome with a gracious smile,
 And calls them brothers, friends, and citizens.*
 Upon his placid face there is no note
 How the day's honour hath fatigued him,
 But freshly looks, and overbears attaint
 With cheerful semblance, and sweet courtesy;
 And every guest, beholding dinner served up,
 Plucks comfort from the noble, sumptuous banquet,
 A largess universal!—Now, last, behold
 A little touch of revels in the night,
 And so our scene must to the ball-room fly;
 Where (*O for a ticket!*), look to behold
'Earth-treading stars,' 'lights that mislead the morn'
 Right well disposed in dance harmonious,
 To close the honours of this happy day.

At the last Lord Mayor's Day (1815), independently of two persons in complete armour, and a third partially armed, representing antient knights, with their attendants, 'squires, heralds, standard-bearers, &c.; the procession was rendered very interesting by small parties of horse soldiers, arrayed as cuirassiers, in the spoils so bravely won at the ever-memorable battle of Waterloo!

A very splendid banquet is on these occasions provided at Guildhall, at the expense of the Lord Mayor and Sheriffs, and about 1300 persons, male and female, sit down to dinner; which, from the disposition of the tables, the sumptuousness of the viands, the arrangement of the company, the brilliancy of the lights, music, and decorations, and the general good humour and hilarity that prevails, is one of the most interesting spectacles that can be seen in the British metropolis. The festivities of the day conclude with a grand ball; and, as every possible kind of refreshment is provided for the visitors, the meeting never breaks up till a very late hour. On the last Lord Mayor's Day the use of gas was first introduced, with a very striking effect.

The charges of the Lord Mayor's Feast commonly amount to about 3000*l.*; and, as splendid entertainments are also given at the respective *halls* of the principal city companies, as well as by numerous other parties, the total expenditure for public dinners on this day is supposed to average from 8000*l.* to 10,000*l.*[†].

The constant place of residence for the Lord Mayor since the year 1752, when the building was completed, has been the *Mansion House*, which is an extensive and splendid dwelling. Here he lives in an elegant and princely manner, and has a considerable establishment to maintain his dignity. On all state occasions he is superbly habited, either in a knotted gown, similar to that of the Lord Chancellor, or in one of crimson velvet, as when he precedes the Sovereign: on minor ceremonials, he appears either in a gown of scarlet cloth with a velvet hood, or in one of mazarine blue silk, according to the season, both being richly furred. He wears also a double chain of gold to distinguish his office, or a rich collar of SS, with a costly jewel appendant: when on foot, on official duties, his train is supported by a page, and the mace and sword are carried before him.

† INSCRIBED to an ALDERMAN.

Know ye the land where the leaf of the myrtle
Is bestowed on good livers in eating sublime?
Where the rage for *fat ven'son*, and love of the *turtle*,
Preside o'er the realms of an Epicure clime?
Know ye the land where the juice of the vine
Makes Aldermen learned, and Bishops divine?
Where each *Corporation*, deep flushed with its bloom,
Waxes fat o'er the eyes of the claret's perfume?
Thick spread is the table with choicest of fruit,
And the voice of the Reveller never is mute:
Their rich robes, tho' varied, in beauty may vie,
Yet the purple of BACCHUS is deepest in dye:—
'Tis the clime of the EAST—the return of the sun
Looks down on the deeds which his children have done:
Then wild is the note, and discordant the yell,
When, reeling and staggering, they hiccup—*Farewel*.

Many of the Lord Mayors of this metropolis have been renowned for their talents and general virtues; and there is not a single quality that can adorn the human heart, but what has been displayed by these magistrates. The most disinterested public spirit, and the noblest beneficence, the purest patriotism, and the firmest integrity, have all united in the illustrious characters of many that have filled the civic chair; and numerous are the instances in which this high office has been attained, and most *worthily* held, by those who, at the outset of life, to employ the language of a late eminent moralist (Dr. Johnson), 'had to provide food for the day that was passing over them.' The ennobled families of Cornwallis, Capel, Coventry, Legge, Cowper, Thynne, Craven, Marsham, Pulteney, Hill, Holles, Osborne, Cavendish, Bennet, and many others, have sprung either immediately or collaterally from those who have been Mayors, Sheriffs, or Aldermen of this city; and it may be affirmed with truth, that a very enlarged proportion of the Peerage of the United Kingdom is related, by descent or intermarriage, to the citizens of London.

The present highly-respected Chief Magistrate (*Matthew Wood, Esq.*) has been re-elected Lord Mayor by the Livery of London, and has entered into the *second year* (1816) of his arduous duties. This is a most unusual occurrence; for not a single instance of the same person having been *twice elected in successive years* is recorded in the annals of the city, since within a very short period of the Revolution, and not for upwards of three centuries prior to that memorable event¹.

11.—SAINT MARTIN.

He was a native of Hungary, and, for some time, followed the life of a soldier; but, afterwards, took

¹ See a Tract, entitled '*Civic Honours*,' whence these particulars have been gleaned. (Sherwood and Co., 1816.)

orders, and was made Bishop of Tours, in France, in which see he continued for twenty-six years. Martin died about the year 397, much lamented, and highly esteemed for his virtues. This Bishop was once so popular in France, that his feast had an octave, that is, was celebrated a second time in the week following; and it was a rule among his devotees to roast a goose for the family dinner on the day of his anniversary. A medal has lately been struck in France in commemoration of this laudable custom; on one side of which is embossed a goose, and on the reverse occurs the word *Martinale*.

Diodorus Siculus speaks of the goose as a regular and favourite diet of Egyptian kings; and, on several of the monuments constructed by them, priests are represented offering a goose in sacrifice. Athenæus mentions the fondness of the Lacedæmonians for the goose; and the Romans not only valued it as a delicacy, but kept holy geese at the public expense, in honour of those which saved the capitol. According to Lampridius, Geta gave orders to his cook to serve his dinners in alphabetic order. To-day every dish was to begin with an *a*, and to-morrow with a *b*; and thus the caesar under him had the honour of ushering in every cycclus of repasts.

Alexander Severus commonly dined on chickens; but he added a goose on solemn occasions, such as the birthday of those worthies whom he honoured with a select veneration. Horace praises the liver of a goose that has fed on figs; and Pliny describes a method of swelling it, which he hesitates whether to attribute to Scipio Metellus or to Marcus Scaurus: but he awards to Messalinus Cotta the indisputable honour of inventing a dish consisting of *goose's feet grilled*.

The festival of St. Martin occurring when geese are in high season, it is always celebrated with a voracity the more eager, as it happens on the eve of the *petit carême*, when fowls could no longer be presented on

the tables of a religious age. A German monk, Martin Schoock, has made it a case of conscience whether, even on the eve of the little Lent, it be allowable to eat goose: '*An liceat Martinalibus anserem comedere?*' After having dived into the weedy pool of the casuist's arguments, the delighted devotee emerges with the permission to roast his goose; and thus the goose came to be a standing dish on the Continent at Martinmas, as in England at Michaelmas.

Charlemagne was fond of geese, and contributed to give them a vogue; and they formed at one time so important an object of rural economy, that the first poulterers were called *oyers*. Geese are rarely boiled, but usually roasted; and they were stuffed by the Romans with white meats, as by the Germans with chesnuts. The legs are sometimes separated, and salted apart for hams¹.

Formerly, a universal custom prevailed of killing cows, oxen, swine, &c., at this season, which were cured for winter consumption; as fresh provisions were seldom or never to be had during the dreary months which succeed November. This practice is yet retained in some country villages. Martinmas is still celebrated on the Continent by good eating and drinking; and was antiently, in England, a day of feasting and revelry, as will appear by some extracts from a pleasing little ballad, entitled *Martilmasse-day*:—

It is the day of *Martilmasse*,
Cuppes of *ale* should frellie passe;
What though wynter has begunne
To push downe the summer sunne,
To our fire we can betake,
And enjoye the crackling brake;

¹ See a notice of M. Millin's '*Martinales*,' or description of the Martinmas Medal, in the *Monthly Review*, vol lxxx, p. 498. The reader may also refer to *Michaelmas Day*, in this and our former volumes.

Never heedinge wyater's face
On the day of Martilmasse.

Some do the citie now frequent,
Where costlie shows and merriment
Do wease the vaporish ev'ninge out
With interlude and revellings rout;
Such as did pleasure Englaunde's queene,
When here her royal Grace was seen;
Yet will they not this daye let passe,
The merrie daye of Martilmasse.

When the dailie sportes be done,
Round the market crosse they runne;
Prentis laddes, and gallant blades,
Dancing with their gamesome maids,
Till the beedel, stout and sowre,
Shakes his bell, and calls the houre;
Then farewell ladde and farewell lasse
To th' merry night of Martilmasse.

Martilmasse shall come againe,
Spite of wind and snow and raine;
But many a strange thing must be done,
Many a came be lost and won,
Many a toel must leave his pelfe,
Many a worldlinge cheat himselfe,
And many a marvel come to passe,
Before return of Martilmasse.

13.—SAINT BRITUS.

Britius, or Brice, succeeded St. Martin in the bishopric of Tours in the year 399. He died in 444.

*15. 1635.—THOMAS PARR DIED, ET. 152!

*16. 1773.—DR. HAWKESWORTH DIED.

The hour is hastening, in which, whatever praise or censure I have acquired will be remembered with equal indifference.—TIME, who is impatient to date my last paper, will shortly moulder the hand, which is now writing, in the dust, and still the breast that now throbs at the reflection. But let not this be read as something that relates only to another; for a few years only can divide the eye that is now reading from the hand that has written.—*Epitaph at Bromley, Kent.*

17.—SAINT HUGH.

Our saint was a native of Burgundy, or Gratianopolis, and died on this day, in the year 1200, of an ague. In 1220, he was canonized at Rome, and his remains were taken up, October 7, 1282, and deposited in a silver shrine.

*17. 1755.—LOUIS XVIII, KING OF FRANCE, BORN.

20.—EDMUND, KING AND MARTYR.

Edmund, King of the East-Angles, having been attacked by the Danes in 870, and unable to resist them, heroically offered to surrender himself a prisoner, provided they would spare his subjects. The Danes, however, having seized him, used their utmost endeavours to induce Edmund to renounce his religion; but refusing to comply, they first beat him with clubs, then scourged him with whips, and afterwards, binding him to a stake, killed him with their arrows. His body was buried in a town, where Sigebert, one of his predecessors, had built a church; and where afterwards (in honour of his name) a more spacious building was erected, which, together with the town, was named St. Edmunds-bury; but it is now called *Bury*. One of the most elegant cemeteries in Europe stands in the centre of two churchyards at Bury St. Edmunds. It is an isolated fragment of the celebrated abbey in which John of Lydgate was a monk, and around it are planted shrubs, trees, and a variety of flowers: a profusion of ivy creeps up the sides of the walls, on which are placed two or three monuments.

22.—SAINT CECILIA.

Cecilia was a Roman lady, who, refusing to renounce her religion, was thrown into a furnace of boiling water, and scalded to death. Others say that she was stifled in a bath, a punishment frequently inflicted, at that time, on female criminals of rank.

She suffered martyrdom about the year 225. Cecilia is regarded as the patroness of music, and is represented by Raffaele with a regal in her hand.

23.—SAINT CLEMENT.

Clement I was born at Rome, and was one of the first bishops of that place; this see he held about sixteen years; from the year 64 or 65 to 81. He was remarkable for having written two Epistles, so excellent; and so highly esteemed by the primitive Christians, that the first was for some time considered canonical. Clement was sentenced to work in the quarries, and afterwards, having an anchor fastened about his neck, was drowned in the sea.

23.—O. MART.

Old Martinmas-Day, an antient quarter day.

25.—SAINT CATHERINE.

Our saint was born at Alexandria, and received a liberal education. About the year 305, she was converted to Christianity, which she afterwards professed with the utmost intrepidity, openly reproving the pagans for offering sacrifices to their idols, and upbraiding the Emperor Maxentius, to his face, with the most flagrant acts of tyranny and oppression. She was condemned to suffer death by rolling a wheel over her body stuck round with iron spikes.

*25. 1748.—DR. WATTS DIED.

Seize on TRUTH, where'er 'tis found,
Among your friends, among your foes,
On Christian or on Heathen ground.

The flower's divine where'er it grows:

Neglect the prickles, and assume the rose.

WATTS.

*28. 1530.—CARDINAL WOLSEY DIED.

Cromwell, I did not think to shed a tear
In all my miseries; but thou hast forced me
Out of thy honest truth to play the woman.
Let's dry our eyes: and thus far hear me, Cromwell;

And,—when I am forgotten, as I shall be;
 And sleep in dull cold marble, where no mention
 Of me more must be heard of,—say, I taught thee,
 Say, *Wolsey*,—that once trod the ways of glory,
 And sounded all the depths and shoals of honour,—
 Found thee a way, out of his wreck, to rise in;
 A sure and safe one, though thy master missed it.
 Mark but my fall, and that that ruined me.
 Cromwell, I charge thee, *fling away AMBITION*;
 By that sin fell the angels; how can man then,
 The image of his Maker, hope to win by't?
 Love thyself last: cherish those hearts that hate thee;
 Corruption wins not more than honesty.
 Still in thy right hand carry gentle peace,
 To silence envious tongues. *Be just, and fear not*:
 Let all the ends thou aim'st at be thy country's,
 Thy God's, and truth's; then if thou fall'st, O Cromwell,
 Thou fall'st a blessed martyr. Serve the king;
 And,—Pr'ythee, lead me in:
 There take an inventory of all I have,
 To the last penny; 'tis the king's: my robe,
 And my integrity to heaven, is all
 I dare now call mine own. O Cromwell, Cromwell,
 Had I but served my God with half the zeal
 I served my king, he would not in mine age
 Have left me naked to mine enemies.

SHAKESPEARE.

30.—ADVENT SUNDAY.

This and the three subsequent Sundays, which precede the grand festival of Christmas, take their name from the Latin *advenire*, to come into; or from the word *adventus*, an approach.

30.—SAINT ANDREW.

Andrew was the son of James, a fisherman at Bethsaida, and younger brother of Peter. He was condemned to be crucified on a cross, of the form of an X; and, that his death might be more lingering, he was fastened with cords.

The Order of the Thistle was instituted by Achaius, King of Scotland, in 787, restored by James V, 1540, revived by King James II, in 1687, and re-established by Queen Anne, in 1703.—See T. T. for 1815, p. 303.

Astronomical Occurrences

In NOVEMBER 1817.

THE Sun enters Sagittarius at 54 m. after 2 in the afternoon of the 22d. The Sun will be eclipsed in the morning of the 9th of this month; but the eclipse will be *invisible* in this country. The conjunction will take place at 7 $\frac{1}{2}$ m. after 2 in the morning, in longitude 7° 16' 20 $\frac{1}{2}$ "; Moon's latitude 9' $\frac{2}{3}$ N. The eclipse will be central on the meridian at 4 $\frac{1}{2}$ m. after 2, in East longitude 148° 49 $\frac{1}{2}$, and South latitude 8° 8 $\frac{1}{2}$. The time of his rising and setting for every fifth day of the month is shown in the following table; those for the intermediate epochs must be found by proportion.

TABLE.

Saturday,	Nov. 1st,	Sun rises 12 m. after 7. Sets 48 m. past 4			
Thursday,	— 6th,	. . . 20 . . . 7 . . . 40 . . . 4			
Tuesday,	— 11th,	. . . 29 . . . 7 . . . 31 . . . 4			
Sunday,	— 16th,	. . . 37 . . . 7 . . . 23 . . . 4			
Friday,	— 21st,	. . . 45 . . . 7 . . . 15 . . . 4			
Wednesday,	— 26th,	. . . 51 . . . 7 . . . 9 . . . 4			

The time to be subtracted from apparent time, as shown by a good sun-dial, to obtain mean time, is given in the following

TABLE

Of the Equation of Time for every fifth Day of the Month.

November	1st, from the time by the dial subtract	m.	s.
	6th,	16	15
	11th,	16	11
	16th,	15	46
	21st,	15	0
	26th,	13	54
	31st,	12	28

The Moon will enter her last quarter at 43 m. after 6 in the morning of the 2d; there will be a new Moon at 8 m. after 2 in the morning of the 9th; she will commence her first quarter at 44 m. past 7 in the

evening of the 15th; and the full Moon will take place 56 m. past 9 in the evening of the 23d. The Moon will also be upon the meridian at convenient times for observation on the following days, viz.

November 2d,	at 25 m. after	6	in the morning
3d,	15	7	
16th,	10	7	in the evening
17th,	54	7	
18th,	35	8	
19th,	15	9	
20th,	55	9	
21st,	35	10	
22d,	18	11	

The Moon will be in conjunction with α in Libra at 9 in the evening of the 8th. Jupiter and Georgium Sidus will be in conjunction on the 9th, when the latter planet will be $24\frac{1}{2}$ south of the former. Saturn will be in quadrature at 7 in the morning of the 22d.

The eclipses of Jupiter's satellites are not visible in the vicinity of London this month.

ON THE CALCULATION OF ECLIPSES.

[Continued from p. 296.]

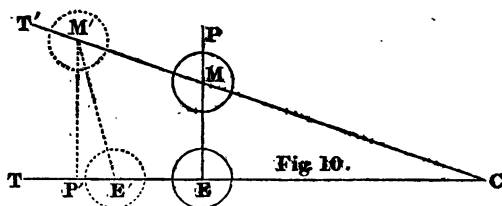
Method of calculating the Circumstances of Lunar Eclipses.

HAVING endeavoured to explain the nature and extent of the shadows projected by the Earth and the Moon in directions opposite to the Sun, considering them as phenomena of which it is important the student should have a distinct comprehension, we shall now explain the method of calculating the other circumstances of eclipses; and, first, those of the Moon.

The principal circumstances which now demand our attention in this inquiry are, the true time of the opposition, the horary motion of the Sun in longitude, that of the Moon in latitude and longitude, the latitude of the Moon's centre at the instant of opposition; all of which are given in astronomical tables of

the Sun and Moon. In addition to these, it is also requisite to have the distance between the centre of the Moon and that of the Earth's shadow, at any given time either before or after the opposition, and then, with these quantities, the time, magnitude, and duration of lunar eclipses may be readily calculated.

For this purpose, let it be supposed that, at the instant of opposition, the point E (fig. 10) represents the centre of the terrestrial shadow. Let TC be the ecliptic, EP the circle of latitude in which the opposition takes place, and M the centre of the Moon at that time: also let T'C be the orbit of the Moon inclined to the ecliptic. Then, in consequence of the Earth's motion in the ecliptic, the centre of the Earth's shadow, which is always diametrically opposite the Sun, moves with it, and always with the same velocity, from west to east, or from C towards T. The centre of the Moon is also in motion at the same time from west to east, or from C towards T'. Now, as these two motions are given in astronomical tables, it is required to determine the instant in which the two circles representing the Moon and the shadow meet, either before or after the true instant of opposition.



This research will be greatly simplified by considering that the apparent distance between the centres of the Moon and the shadow, during the eclipse, which is necessarily very small, may be regarded as rectilinear, and also the difference of latitude and longitude of these centres may be considered as right lines parallel and perpendicular to the ecliptic; so that the move-

ments of these two centres may be conceived to be in straight lines, the one taken on the ecliptic CT , and the other on the circle of latitude passing through the centre of the shadow. The duration of a lunar eclipse is always so short, that the motion of the Sun, and consequently that of the shadow also, may be regarded as uniform for that period. The motions of the Moon in both latitude and longitude may likewise be regarded as uniform for the same time; at least in a first approximation. These considerations greatly simplify the problem.

Let E' and M' be two simultaneous positions of the shadow in the ecliptic, and the Moon in her orbit, at any instant either before or after the opposition. Then, since the motions of the Moon and shadow in both latitude and longitude are known, we shall have the values of $E'P'$ and $P'M'$, which represent these relative motions; and as the triangle $E'P'M'$ is right angled at P' , the sum of the squares of $E'P'$ and $P'M'$ will give the square of $E'M'$, and consequently the root of this sum is $E'M'$ itself. From the value of this distance, we may always know whether the eclipse has commenced, as we have already shown the value of the distance in other terms beyond which eclipses cannot take place. By forming an analytical expression for any time, it will be easy to determine the precise instant of each phase of the eclipse, by the solution of an equation of the second power.

The results thus obtained will only be strictly correct if the motions of the Sun and Moon were uniform; but if the greatest degree of accuracy be required, it is only necessary to calculate the time for any given phase, then to take that instant for the origin of time, and find the motions of the Sun and Moon by the tables, and recommence the calculations with these new quantities, and the result would give a correction of the epoch found by the first approximation. This final result will possess all desirable accuracy, because the supposition of the uniformity

of motion involves so short a period. By performing these operations for each phase of the eclipse successively, all the circumstances of the eclipse, with respect to the true motions of the Sun and Moon, will be accurately ascertained.

In the preceding researches, no account has been taken of the diurnal motions of the heavens; as this causes an apparent simultaneous and equal motion of the Sun and Moon, the plane of the ecliptic, and all the celestial circles, without changing the respective positions of these with respect to each. The only effect of this motion is that of successively presenting the eclipse to different parts of the terrestrial globe; its influence affects only the possibility of seeing it, not its existence.

Now, in order to find the analytical expressions, in which the substitution of the given quantities will furnish the required numerical results, let the horary motion of the Sun, or that of the shadow, in longitude at the instant of the apposition, be denoted by m' ; and any time, either before or after the opposition, expressed in hours and fractions of an hour, by t , the time being considered negative before and positive after the moment in which the opposition takes place; then the distance of the centre of the shadow, at any given time from the point E, will be expressed by $m't$. Also, let n and m denote the horary motions of the Moon in latitude and longitude, commencing at the same epoch. Then the space through which she will have moved, parallel to the ecliptic in the time t , will be expressed by mt , and that on a circle of latitude by nt ; so that if the Moon's latitude, at the instant of the opposition, be indicated by l , the two co-ordinates of her centre will be expressed by mt and $l + nt$. As the motions of the Sun and Moon are both from west to east, both m' and m will always have the same sign, and are regarded as positive; but that is not the case with respect to n ; for it is considered as positive

when the Moon approaches the north pole of the ecliptic, and negative when she removes from it: l is also positive for north, but negative for south latitudes. These quantities, with their proper signs, are to be found in astronomical tables.

Let the distance between the centres of the Moon and the shadow, at any instant, be expressed by d , which will evidently be the hypotenuse of a right angled triangle, having for its sides the differences of their movements in latitude and longitude; and $l + nt$, or $(m - m')t$. We have, therefore,

$$(m - m')^2 t^2 + (l + nt)^2 = d^2.$$

Squaring the second term of this equation, and simplifying it by the substitution of an auxiliary angle a , such that the

$$\text{tang } a = \frac{n}{m - m'},$$

$m - m'$ will be eliminated, and its solution then gives

$$t = \frac{s}{n} (\pm \sin a (d^2 - l^2 \cos^2 a)^{\frac{1}{2}} - l \sin^2 a).$$

Now, the value of d , for any particular phase of the eclipse, being substituted in this expression for t , it will give the epoch corresponding to that phase; and there being always two values of t for every different value of d , the substitution gives the time of the two corresponding phases, the one before the middle of the eclipse, and the other after it; as t is positive in the one case, and negative in the other. The distance of the centres of the Moon and shadow at the beginning and end of the eclipse is known by what precedes; and therefore, by adopting the same notation as in the preceding part of this article, where D and D' denote the apparent diameters of the Sun and Moon, p and p' their horizontal parallaxes, we have, at these two epochs, $d = \frac{1}{2} (D' - D) + p + p'$.

This value of d , found from astronomical tables, and substituted for it, will give the two corresponding values of t , or the two moments at which these circumstances take place. Here it must be remarked that, when the values of t are imaginary, or $l \cos \alpha$ greater than d , no eclipse can take place. When they are just equal to each other, the quantity under the radical becomes equal to nothing, and the two values of t , corresponding to this substitution, are also equal to each other, the edge of the Moon's disc becomes a tangent to the pure shadow, and no eclipse, properly speaking, takes place, but only a simple *appulse*. If it were required to find the time at which the disc of the Moon was just wholly immersed in the shadow, it would be obtained, making $d = p + p' - \frac{1}{2}(D + D')$.

Another interesting epoch is the middle of the eclipse, which evidently takes place when the two values of t are equal to each other, and the radicle vanishes. Then the distance of the centres of the Moon and the Earth's shadow is equal to $l \cos \alpha$, and

$$t = \frac{l \sin^2 \alpha}{n}.$$

As the middle of the eclipse takes place when the centres are at the least possible distance from each other, that moment is consequently the time of the greatest phase, the magnitude of which is therefore easily found; for if to the distance of the centres, $l \cos \alpha$, the apparent semidiameter of the Moon be added, the sum will be the distance of the Moon's exterior limb from the centre of the shadow; and from this sum the semidiameter of the shadow being subtracted, the remainder will be the part of the Moon's diameter which is not eclipsed; and which is therefore equal to $\frac{1}{2}(D + D') + l \cos \alpha - (p + p')$.

When the value of this quantity is positive, subtracting it from the diameter of the Moon gives the part eclipsed equal to $\frac{1}{2}(D' - D) + p + p' - l \cos a$. Astronomers conceive the diameter of the Moon to be divided into 12 equal parts, which they call *digits*; the number of which may readily be found by a simple proportion, by saying, as the whole diameter : to the part eclipsed :: 12 : to the number of digits answering to this part.

When the value of the above quantity is equal to nothing, then it shows that the eclipse is just *total*; and when it becomes negative, it expresses the distance which the exterior limb of the Moon is immersed within the Earth's shadow.

The total duration of an eclipse may also be easily found by subtracting the time answering to the beginning from that corresponding to the end; and which will give the

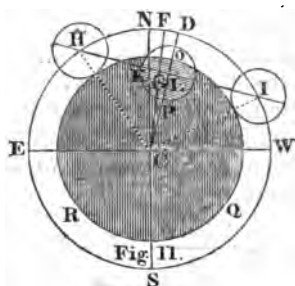
$$\text{duration} = \frac{2 \sin a}{n} (d - l^2 \cos^2 a)^{\frac{1}{2}};$$

in which expression the values of d , corresponding to these epochs, must be substituted; that is, $d = \frac{1}{2}(D' - D) + p + p'$.

The business of calculating lunar eclipses is therefore reduced to finding the given quantities for the exact time of the opposition, by means of solar and lunar tables, and substituting them in the preceding formulæ: our limits, however, prevent us from giving an example of this process; and we shall therefore supply its place with the following easy geometrical construction, which such of our readers as are not accustomed to calculations of this kind will most likely prefer.

From what has been shown in the former part of this article, the semidiameter of the Earth's shadow, at the time of the eclipse, may be easily determined; and with this as a radius, and C as a centre, describe the circle OQR (fig. 11) to represent it,

Let ECW be a part of the ecliptic, and through C draw CN or CS, according as the Moon's latitude, at the time of the eclipse, is north or south, perpendicular to ECW. Make the angle NCD equal to that which the orbit of the Moon forms with the ecliptic; the mean value of which has already been stated, in a previous article, to be about $5^{\circ}.15$, or nearly $5^{\circ} 10'$. Bisect this angle with the line CF, in which the opposition of the Sun and Moon, as given by the tables, takes place.



From a convenient scale of equal parts, representing minutes of a degree, take the Moon's latitude at the true time of opposition, and set it off from C to G, on the line CF. Through the point G, and at right angles to CD, draw the line HKGLI, to represent the path of the Moon's centre. Then L is the place of the Moon's centre at the middle of the eclipse, G the point of that centre at the time of full Moon, as given by the tables; and K the point occupied by her centre at the instant of her ecliptic opposition; also, I the place of her centre at the beginning of the eclipse, and H at the end of it. Then, with the Moon's semidiameter as a radius, and the centres I, L, and H, describe circles which will represent the Moon at the commencement, middle, and termination of the eclipse. From the length of the line IH, measured on the same scale, the du-

ration of the eclipse may be determined, by saying, as the Moon's horary motion from the Sun (that is, the excess of her horary motion above that of the Sun) : the length of the line IH :: 60' : the duration required. Finally, by measuring the distance OP on the same scale, and making the proportion above pointed out, the digits eclipsed will readily be obtained.

[To be concluded next Month.]

The Naturalist's Diary.

The wood-path is carpeted over with leaves,
 The glories of AUTUMN decay;
 The Goddess of Plenty has bound up her sheaves,
 And carried the *harvest* away.
 With dissonant guns, hills and vallies resound,
 The swains through the coppices rove;
 The *partridges* bleed on the dry stubble ground,
 The *pheasants* lie dead in the grove.

GLOOMY as this month usually is, yet there are some intervals of clear and pleasant weather: the mornings are, occasionally, sharp, but the hoarfrost is soon dissipated by the Sun, and a fine open day follows.

A few soft days succeed
 Of pleasing mildness; but the varying storm
 By fits prevails, or, wrapped in terror, whirls
 The last, the lingering honours from the grove.

The trees are now stripped of their foliage. The separation of the leaves from their branches is termed the *fall*; and, in North America, the season in which this takes place is universally known by that name. The falling of leaves is not always in consequence of the injuries of autumnal frosts, for some trees have their appropriate period of defoliation, seemingly independent of external causes. The lime (*tilia europæa*) commonly loses its leaves before any frost happens; the ash seems, on the contrary, to wait for that event; and at whatever period the

first rather sharp frost takes place, all its leaves fall at once. The fall of the leaf can be considered only as a 'sloughing or casting off diseased or worn-out parts,' whether the injury to their constitution may arise from external causes or from an exhaustion of their vital powers. Hence a separation takes place, either in the foot-stalk, or more usually at its base, and the dying part quits the vigorous one, which is promoted by the weight of the leaf itself, or by the action of autumnal winds upon its expanded form. Sometimes, as in the hornbeam, the beech, and some oaks, the swelling of the buds for the ensuing season is necessary to accomplish the total separation of the old stalks from the insertions.

How fall'n the glories of these fading scenes!
 The dusky *beech* resigns his vernal greens;
 The yellow *maple* mourns in sickly hue,
 And russet woodlands crown the dark'ning view.
 Dim, clust'ring fogs involve the country round;
 The valley, and the blended mountain ground,
 Sink in confusion: but with tempest wing,
 Should Boreas from his northern barrier spring,
 The rushing woods with deaf'ning clamour roar,
 Like the sea tumbling on the pebbly shore:
 When spouting rains descend in torrent tides,
 See the torn zig-zag weep its channelled sides.

WHITE.

Leaves undergo very considerable changes before they fall; ceasing to grow for a long time previous to their decay, they become gradually more rigid and less juicy, often parting with their pubescence, and always changing their healthy green colour to more or less of a yellow, sometimes a reddish hue. 'One of the first trees that becomes naked is the walnut; the mulberry, horse-chesnut, sycamore, lime, and ash, follow. The elm preserves its verdure for some time longer: the beech and ash are the latest deciduous forest trees in dropping their leaves. All lopped trees, while their heads are young, carry their leaves a long while. Apple-trees and peaches re-

main green very late, often till the end of November : young beeches never cast their leaves till spring, when the new leaves sprout, and push them off : in the autumn, the beechen leaves turn of a yellow deep chesnut colour.'—(*White.*)¹

The effect of a 'whirl-blast,' or sudden gust of wind, accompanied with hail (not infrequent at this season), on the falling leaves, is thus prettily and naturally delineated by the poet of the mountains :—

But see ! where'er the hailstones drop,
The withered leaves all skip and hop ;
There's not a breeze—no breath of air—
Yet here, and there, and every where,
Along the floor, beneath the shade
By those embowering hollies made,
The leaves in myriads jump and spring,
As if with pipes and music rare
Some Robin Goodfellow were there,
And all those leaves in festive glee
Were dancing to the minstrelsy.

WORDSWORTH.

A tree has ever been considered as an *emblem of life* ; and in this view, this pleasing object in nature, which we meet with in every direction, is replete with instruction. The contemplative mind regards it with peculiar interest, and derives from it no inconsiderable improvement. The elegant 'Gilpin' has availed himself of this striking resemblance in the following beautiful reflections :

As I sat carelessly at my window (he observes), and cast my eyes upon a large acacia which grew before me, I conceived that it might aptly represent a country divided into *provinces, towns, and families*. The large branches might hold out the first—the smaller branches connected with them, the second—and those combinations of collateral leaves which specify the acacia might represent families composed

¹ For a popular description of *Forest Trees*, illustrated by poetical citations from the classics, and from modern poets, we refer to our last volume, pp. 37, 65, 95, 127, 159, 184, 215, 243, 277, 309, 328, 352.

of *individuals*. It was now late in the year, and the autumnal tints had taken possession of great part of the tree.

As I sat looking at it, many of the yellow leaves (which having been produced earlier decayed sooner) were continually dropping into the lap of their great mother. Here was an emblem of *natural decay*—the most obvious appearance of mortality.

As I continued looking, a gentle breeze rustled among the leaves. Many fell, which in a natural course might have enjoyed life longer. Here *malady* was added to decay.

The blast increased, and every branch which presented itself bowed before it. A shower of leaves covered the ground. The cup of retribution, said I, is poured out upon the people. Pestilence shakes the land. Nature sickens in the gale: they fall by multitudes. Whole families are cut off together.

Among the branches was one entirely withered. The leaves were shrivelled, yet clinging to it. Here was an emblem of *famine*. The nutriment of life was stopped. Existence was just supported, but every form was emaciated and shrunk.

In the neighbourhood stretched a branch not only shrivelled and withered, but, having been more exposed to winds, it was almost entirely stripped of its leaves. Here and there hung a solitary leaf just enough to show that the whole had lately been alive. Ah! said I, here is an emblem of *depopulation*. Some violent cause hath laid waste the land. Towns and villages, as well as families, are desolated: scarcely ten are left alive to bemoan a thousand.

How does every thing around us bring its lesson to our minds! *Nature is the great book of God*. In every page is instruction to those who will read. Morality must claim its due. Death in various shapes hovers round us.—Thus far went the heathen moralist. He had learned no other knowledge from these perishing forms of nature; but that men, like trees, are subject to death.

The meanest herb we trample in the field
 Or in the garden nurture, when its leaf
 In *Autumn dries*, forebodes another *Spring*,
 And from short slumber wakes to life again.
 Man wakes no more ! Man, peerless, valiant, wise,
 Once chilled by death, sleeps hopeless in the dust,
 A long, unbroken, never-ending sleep.

MOSCHUS.

*Better instructed, learn thou a nobler lesson.
 Learn that the God who, with the blast of winter,
 shrivels the tree, and with the breezes of spring re-
 stores it, offers it to thee as an emblem of thy hopes !
 The same God presides over the natural and moral
 world : His works are uniform. The truths which
 nature teaches are the truths of revelation also. It is
 written in both these books, that the power which re-
 vives the tree will revive thee also like it, with increas-
 ing excellence and improvement.*

Happy he,
 Whom what he views of beautiful, or grand,
 In nature, from the broad majestic oak
 To the green blade that twinkles in the Sun,
 Prompt with remembrance of a PRESENT GOD.

COWPER.

The excellent Bishop HORNE has a beautiful little Poem on this subject, which is too interesting to be omitted in this place ; we can have no better companion in our autumnal walks than these fine moral stanzas :—

See the leaves around us falling,
 Dry and withered to the ground !
 Thus to thoughtless mortals calling
 With a sad and solemn sound :—

‘ Sons of Adam—once in Eden,
 Blighted when like us you fell,
 Hear the lecture we are reading,
 ’Tis, alas ! the truth we tell.

‘ *Virgins !* much, too much presuming,
 In your boasted white and red,
 View us late in beauty blooming,
 Numbered now among the dead.

- ' *Gripping Misers!* nightly waking,
 See the end of all your care ;
 Fled on wings of our own making,
 We have left our owners bare.
- ' *Sons of Honour!* fed on praises,
 Flutt'ring high on fancied worth,
 Lo! the fickle air that raises
 Brings us down to parent Earth.
- ' *Learned Sophs!* in systems jaded,
 Who for new ones daily call,
 Cease at length by us persuaded,
 Every leaf must have a fall.
- ' *Youths!* though yet no losses grieves you,
 Gay in health and manly grace,
 Let not cloudless skies deceive you—
 Summer gives to Autumn place.
- ' *Venerable Sires!* grown hoary,
 Hither turn th' unwilling eye ;
 Think, amid your falling glory,
 Autumn tells a Winter nigh.
- ' Yearly in our course returning,
 Messengers of shortest stay,
 Thus we preach this truth unerring,
 Heav'n and Earth shall pass away!
- ' On the *Tree of Life* Eternal
 MAN! let all thy hopes be staid,
 Which alone, for ever vernal,
 Bears a leaf which ne'er shall fade!

The Virginia creeper (*hedera quinque-folia*) is particularly rich and beautiful in the autumnal months, with its leaves of every hue, from a bright to a dark green and deep crimson.

That highly-esteemed fish, the *salmon*, now ascends rivers to deposit its spawn in their gravelly beds, at a great distance from their mouths. In order to arrive at the spots proper for this purpose, there are scarcely any obstacles which the fish will not surmount. They will ascend rivers for hundreds of miles ; force themselves against the most rapid streams, and spring with amazing agility over cataracts of several feet in height. They are taken, according to Mr. Pennant, in the Rhine, as high as Basle : they gain the sources of the

Lapland rivers, in spite of their torrent-like currents : they surpass the perpendicular falls of Leixlip, Kennerth, and Pont Aberglasslyn. At the latter of these places, Mr. Pennant assures us that he has himself witnessed the efforts of the salmon, and seen scores of fish, some of which succeeded, while others miscarried, in the attempt, during the time of observation. At this time, nets or baskets are placed under the fall, and numbers are taken after an unsuccessful leap. It may be added, that the salmon, like the swallow, is said to return, each season, to the self-same spot to deposit its spawn.

The stock-dove (*columba ænas*), one of the latest winter birds of passage, arrives from more northern regions, towards the end of this month. Before our beechen woods were destroyed (observes Mr. White), there were myriads of them, reaching in strings for miles together. At this time, twenty have been killed in a day ; and an old sportsman assured me, that, with a large fowling-piece, he had shot seven or eight at a time on the wing, as they came wheeling over his head. The food of these numberless emigrants was beech-mast and some acorns, and particularly barley, which they collected in the stubbles ; they also eat the young tops of turnips.

—
All the pride

Of the SWEET GARDEN fades. Where now the rose,
The *lupin*, *aster*, *balsam*, or *carnation* ?
Or where the *lily*, with her snowy bells ?
Where the gay *jasmin*, odorous *syringa*,
Graceful *laburnum*, or bloom-clad *arbut* ?
Or if we stray, where now the summer's walk
So still and peaceable at early eve,
Along the shady lane, or through the wood,
To pluck the ruddy *strawberry*, or smell
The perfumed breeze that all the fragrance stole
Of *honey-suckle*, blossomed *beans*, or *clover* ?
Where now the blush of Spring, and the long day
Beloitered ? cheerful May, that filled the woods
With music, scattered the green vale with flow'rs,
And hung a smile of universal joy
Upon the cheek of nature ? Where blooms now

The *king-cup* or the *daisy*? Where inclines
 The *harebell* or the *cowslip*? Where looks gay
 The vernal *furze* with golden baskets hung?
 Where captivates the sky-blue *periwinkle*
 Under the cottage-eaves? Where waves the leaf,
 Or rings with harmony the merry vale?
 Day's harbinger no song performs, no song
 Or solo anthem deigns sweet Philomel.
 The golden *wood-pecker* laughs loud no more.
 The *pye* no longer prates; no longer scolds
 The saucy *jay*. Who sees the *goldfinch* now
 The feathered *groundsel* pluck, or hears him sing
 In bower of *apple blossoms* perched? Who sees
 The chimney-haunting *swallow* skim the pool,
 And quaintly dip, or hears his early song
 Twittered to dawning day? All, all are hushed.
 The very *bee* her merry toil foregoes,
 Nor seeks her *nectar*, to be sought in vain,
 Only the solitary *ROBIN* sings,
 And, perched aloft, with melancholy note
 Chants out the dirge of Autumn; cheerless bird,
 That loves the brown and desolated scene,
 And scanty fare of Winter¹.

The females and young of the brown, or *Norway rat*, now leave their holes at the sides of ponds and rivers, - to which they had betaken themselves in the spring, and repair to barns, out-houses, corn-stacks, and dwellings. The males are said to remain in their holes, having laid up a winter store of acorns, beech-mast, &c. It is supposed that a rat will consume half a peck of wheat in a week, which may be set, at least, at sixteen pence; and if a man has only two score quartered upon him (and well off is that farm which has so few), their board will stand the farmer in upwards of *fifty shillings* a week,—the rent of a good farm².

The *woodman* now repairs to the woodlands to fell coppices, underwood, and timber. The appearance of a wood with the underwood cut, or during the time of cutting, is a very pleasing sight. The fine

¹ Hurdis's *Village Curate*, p. 100.

² See Lawrence's *New Farmer's Calendar*, article *Vermin*.

majestic trees opened to view, which were before hidden among the general and thick mass of foliage or branches, the smaller wood, some laid up in poles, some in faggots, and some in logs; while the ground presents a soft treading of moss and leaves among the old stumps, which are for the most part covered with moss and ivy. In the spring, this carpet is enriched with the flowers of the primrose, the ox-lip, and the cowslip, the wood anemone, the hyacinth, and a variety of others; and the scene is, perhaps, diversified by the trunks of oaks stripped of their bark, and the bark laid up in piles of regular dimensions, ready to be carried away by the tanner. In places where charcoal is made, there is the additional circumstance of the heaps of wood covered over with sods, and smoking: the curls of blue smoke seen at a little distance, ascending against the wood, are very picturesque.

The farmer usually finishes his ploughing this month. Cattle and horses are taken into the farm-yard; sheep are sent to the turnip-field; ant-hills are destroyed; and bees are put under shelter.

We shall close this month's Diary with the following *poetical bouquet* of wild flowers, which cannot fail of being acceptable to our readers in the gloomy month of *November*, when scarcely a flower is to be found, except by those who possess the luxury of a green-house and hot-house, a never-ending source of amusement and instruction to the juvenile botanist and admirer of the beauties of nature. The several flowers are described with a truth and delicacy that do equal credit to the refined taste and botanical knowledge of the fair author.

Fair rising from her icy couch
 Wan herald of the floral year,
 The *snow-drop* marks the spring's approach,
 Ere yet the primrose groups appear,
 Or peers the *aurun** from its spotted veil,
 Or odorous *violets* scent the cold capricious gale.

Then, thickly strewn in woodland bowers,
Anemonies their stars unfold,
 There spring the *sorrel's* veined flowers,
 And rich in vegetable gold.
 From calyx pale, the freckled *cowslip* born,
 Receives in amber cups the fragrant dews of morn.

Lo ! the green *thorn* her silver buds
 Expands to May's enliv'ning beam ;
*Hottonia*¹ blushes on the floods,
 And where the slowly trickling stream
 Mid grass and spiry rushes stealing glides,
 Her lovely fringed flowers fair *menyanthus*² hides.

In the lone copse, or shadowy dale,
 Wild clustered knots of *harebells* blow,
 And droops the *lily* of the vale.
 O'er *vinca's*³ matted leaves below
 The *orchis* race with varied beauty charm,
 And mock the exploring *bee* or *fly's* aerial form.

Wound in the hedge-row's oaken boughs,
 The *woodbine's* tassels float in air,
 And, blushing, the uncultured *rose*
 Hangs high her beauteous blossoms there ;
 Her fillets there the purple *nightshade* weaves,
 And the *brionia* winds her pale and scoloped leaves.

To later Summer's fragrant breath
*Clematis's*⁴ feathery garlands dance ;
 The hollow *fox-glove* nods beneath,
 While to tall *mullein's* yellow lance,
 Dear to the mealy tribe of ev'ning towers,
 And the weak *gallium*⁵ weaves its myriad fairy flowers.

Sheltering the *coot's* or *wild-duck's* nest,
 And where the timid *halcyon* hides,
 The *willow-herb*, in crimson drest,
 Waves with *arundo* o'er the tides ;
 And there the bright *nymphæa*⁶ loves to lave,
 Or spreads her golden orbs upon the dimpling wave.

And *thou*, by pain and sorrow blest,
Papaver !⁷ that an opiate dew
 Conceal'st beneath thy scarlet vest,
 Contrasting with the *corn-flower* blue,
 Autumnal months behold thy gauzy leaves
 Bend in the rustling gale amid the tawny sheaves.

¹ Water violet.
 Virgin's bower.
 White water lily.

² Bogbean.
⁵ Yellow lady's bed-straw.
⁷ Common poppy.

³ Periwinkle.

From the first bud, whose venturous head
 The *Winter's* lingering tempest braves,
 To those which, mid the foliage dead,
 Sink latest to their *annual* grave,
All are for *health*, or *food*, or *pleasure* given,
 And speak in various ways the bounteous hand of Heaven!

CHARLOTTE SMITH.

DECEMBER.

DECEMBER was called *winter-monat* by the Saxons; but, after they were converted to Christianity, it received the name of *heligh monat*, or holy month.

Remarkable Days.

6.—SAINT NICHOLAS.

NICHOLAS was Bishop of Myra, in Lycia, and died about the year 392. He was of so charitable a disposition, that he portioned three young women, who were reduced in circumstances, by secretly conveying a sum of money into their father's house. A curious font is preserved in the Cathedral of Winchester, the carvings on which are applied to the life and miracles of this saint. The annual ceremony of the *boy-bishop*, once observed on this day, is described at length in T. T. for 1814, p. 306-308.

*7. 1683.—ALGERNON SIDNEY BEHEADED.

He was a man of most extraordinary courage, steady even to obstinacy, sincere, but of a rough and boisterous temper that could not bear contradiction. He seemed to be a Christian, but in a particular form of his own: he thought it was to be like a divine philosophy in the mind; but he was against all public worship, and every thing that looked like a church. He was stiff to all republican principles, and an enemy to every thing that looked like a mo-

narchy. He had studied the history of government in all its branches beyond any man I ever knew ; and had a particular way of insinuating himself into people that would hearken to his notions, and not contradict him.—*Bp. Burnet.*

Here SIDNEY lies, he whom perverted law
The pliant jury and the bloody judge
Doomed to the traitor's death. A tyrant king
Required, an abject country saw and shared
The crime. The noble cause of *Liberty*
He loved in life, and to that noble cause
In death bore witness. But his country rose
Like Samson from her sleep, and broke her chains;
And proudly with her worthies she enrolled
Her murdered Sidney's name. SOUTHEY.

*7. 1815.—MARSHAL NEY SHOT.

Having arrived at the place of execution, a spot in the Luxembourg Garden, near the observatory, he got out of the coach, and walked up with a firm step to the detachment of veterans, who, having formed themselves into a semicircle facing the wall, were ready for the purpose. He took off his hat to them, crossed his arms, and said, '*Soldiers, I am innocent, I die innocent, and I appeal from this iniquitous judgment to God and to posterity.*' He immediately unfolded his arms. '*Do your duty,*' he exclaimed. The volley was fired, and he fell. Two balls struck him in the head, four in the body, and one passed through his heart.

8.—CONCEPTION OF THE VIRGIN MARY.

This festival was instituted by Anselm, Archbishop of Canterbury, because William the Conqueror's fleet, being in a storm, afterwards came safe to shore. The Council of Oxford, however, held in 1222, permitted every one to use his discretion in keeping it.

13.—SAINT LUCY.

This virgin martyr was born at Syracuse. She refused to marry a young man who paid his addresses to her, because she had determined to devote herself

to religion, and, to prevent his importunities, gave her whole fortune to the poor. The youth, enraged at this denial, accused her before Paschasius, the heathen judge, of professing Christianity; and Lucy, after much cruel treatment, fell a martyr to his revenge, in the year 305.

***13. 1784.—DR. SAMUEL JOHNSON DIED.**

*Translation of a Passage in the MEDEA of EURIPIDES,
not printed in Johnson's Works.*

The rites derived from antient days
With thoughtless reverence we praise;
The rites that taught us to combine
The joys of music and of wine;
That bade the feast, the song, the bowl,
O'erfill the saturated soul;
*But ne'er the lute nor lyre applied
To soothe DESPAIR or soften PRIDE,*
Nor called them to the gloomy cells
Where *madness* raves and *vengeance* swells,
Where *hate* sits musing to betray,
And *MURDER* meditates his prey.
To dens of guilt and shades of care
Ye sons of melody repair,
Nor deign the festive hour to cloy
With superfluity of joy;
The board, with varied plenty crowned,
May spare the luxury of sound.

***14. 1799.—GEORGE WASHINGTON DIED.**

16.—O SAPIENTIA.

This is the beginning of an Anthem in the Latin service to the honour of Christ's advent, which used to be sung in the church from this day until Christmas-eve.

***16. 1790.—PRINCE OF SAXE-COBORG-SAALFELD
BORN.**

The extraordinary capacity of this young prince unfolded itself so early as his fifteenth year, in the study of the languages, history, mathematics, bo-

tany, music, and drawing, in which last he has made a proficiency that would be creditable to a professor. In his campaigns, and in the field of battle, where all false greatness disappears, Leopold has given the most undeniable proofs that courage, and a profound sense of religion and liberty, are innate in his soul; and that clear intelligence and unshaken fortitude are his securest possessions. With such qualities of the head and heart, with a character and principles that so completely harmonize with the feelings, the notions, nay, even the prejudices, of the British nation, this illustrious Prince authorizes us to anticipate, from his union with the heiress to the throne, results equally conducive to the welfare of the people at large, and to the happiness of that distinguished family of which he is become a member.—*Shoberl's Memoir of the House of Saxony*, 8vo.

21.—SAINT THOMAS THE APOSTLE.

Thomas, surnamed *Didymus*, or the Twin, was a Jew, and, in all probability, a Galilean. He suffered martyrdom in the same city, being killed by the lances of some people instigated by the Bramins.

This is the shortest day, and is, at London, 7 h. 44 m. 17 s.; allowing 9 m. 5 s. for refraction.

*23. 1777.—ALEXANDER, EMPEROR OF ALL THE RUSSIAS, BORN.

25.—CHRISTMAS DAY.

The feast of our Saviour's nativity is named *Christmas-day*, from the Latin *Christi Missa*, the Mass of Christ, and thence the Roman Catholic Liturgy is termed their *Missal* or *Mass-Book*. In the primitive church this day was always preceded by an eve or vigil. When the devotion of the eve was completed, our forefathers used to light up candles of an uncommon size, which were called *Christmas*

candles, and to lay a log of wood upon the fire, called the *yule-clog* or log¹.

The *turkey* is now the appropriate dish, at the tables of the opulent, on Christmas-day. Gay, in his *Fable of the Turkey and Ant*, makes the old turkey say—

But man, curst man, on *turkey* preys,
And Christmas shortens all our days.
Sometimes with oysters we combine,
Sometimes assist the savoury chine.

Norfolk being the great place for rearing turkeys, the stage coaches from Norwich to London, for some days previous to Christmas-day, take no human passengers, but turkeys only².

When *rosemary* and *bays*, the poet's crown,
Are bawled in frequent cries through all the town,
Then judge the festival of Christmas near,
Christmas, the joyous period of the year!
Now with bright *holly* all the temples strew,
With *laurel* green, and sacred MISLETOE.

GAY.

26.—SAINT STEPHEN.

Stephen was the first deacon chosen by the apostles. He was cited by the Sanhedrin, or Jewish Council, for prophesying the fall of the Jewish Temple and economy; and while vindicating his doctrine by several passages of the Old Testament, he was violently carried out of the city, and stoned to death, in the year 33. See *Acts*, chap. vii, for his admirable defence.

¹ For many other customs formerly observed in England at this season, see T. T. for 1814, p. 309; and, for some particulars of the *Fête de l'Ane*, or Feast of the Ass, see our volume for 1815, p. 318.

² According to *Tusser*, the turkey began to form an article in our Christmas feasts about the year 1585.

Beefe, mutton, and porke, shred pies of the best,
Pig, veale, goose, and capon, and *turkie* well drest;
Cheese, apples, and nuts, jolly carols to heare,
As then in the country is counted good cheare.

*26. 1806.—W. I. ROBERTS DIED.

EPITAPH.

Pilgrim ! if youth's seductive bloom
 Thy soul in pleasure's vest arrays,
 Pause at this sad and silent tomb,
 And learn how swift thy bliss decays !

But, ah ! if woe has stabbed thy breast,
 And dimmed with tears thy youthful eye,
 Mourner, the grave's a house of rest,
 And *this one* teaches how to die !

For she who sleeps this stone beneath,
 Tho' many an hour to pain was given,
 Smiled at the hovering dart of death,
 While Hope displayed the joys of Heaven !

27.—JOHN EVANGELIST. See p. 163 *et seq.*

28.—INNOCENTS.

The slaughter of the Jewish children, by Herod, is commemorated on this day. The festival is very ancient, for Tertullian and Saint Cyprian call these Innocents martyrs, and Prudentius has written a hymn upon the subject. *Childermas* day is another name for this feast. The lower orders think that every thing done on this day must go wrong. John Moody, in Vanbrugh's Play of the 'Provoked Husband,' imputes all the evils which befall the wrong-headed family on their journey to London, to their setting out on *Childermas* day : '*But my lady was in such main haste to be here, that set out she would, thof I told her it was Childermas day.*'

31.—SAINT SILVESTER.

He was Bishop of Rome, and succeeded Miltiades in the papacy, in 314. Silvester is accounted the author of several rites and ceremonies of the Romish church, as asylums, unctions, palls, corporals, mitres, &c. He died in 334.

¹ See Roberts's Poems and Letters, p. 9, a pleasing companion to the Remains of Kirke White. The author died at the early age of *twenty* !

Astronomical Occurrences

In DECEMBER 1817.

THE Sun enters Capricornus at 19 m. after 3 in the morning of the 22d; and the following Table shows the time of his rising and setting on every fifth day during the present month.

TABLE.

Monday,	Dec.	1st,	Sun rises 57 m. after 7. Sets 3m. after 4			
Saturday,	.	6th,	.	.	1 . . . 8 . . . 59 . . . 3	
Thursday,	.	11th,	.	.	5 . . . 8 . . . 55 . . . 3	
Tuesday,	.	16th,	.	.	7 . . . 8 . . . 53 . . . 3	
Sunday,	.	21st,	.	.	8 . . . 8 . . . 52 . . . 3	
Friday,	.	26th,	.	.	7 . . . 8 . . . 53 . . . 3	
Wednesday	.	31st,	.	.	5 . . . 8 . . . 55 . . . 3	

True or mean time will be found from that exhibited by a good sun-dial, by employing the quantities as directed in the following

TABLE

Of the Equation of Time for every fifth Day of the Month.

Dec.	1st, from the time by the dial subtract	m.	s.
	6th,	8	42
	11th,	6	28
	16th,	4	4
	21st,	1	36
	26th, to the time by the dial add	0	54
	31st,	3	21

The Moon will enter her last quarter at 21 m. past 8 in the evening of the 1st; there will be a new Moon at 33 m. after 12 on the 8th; the first quarter will be at 29 m. after 11 in the morning of the 15th; she will be full at 59 m. after 4 in the afternoon of the 23d; and she will enter her last quarter at 33 m. after 7 in the morning of the 31st. The Moon may also be seen on the first meridian at the following convenient times for observation, viz :—

December	1st,	at 53 m.	after	5	in the morning
	2d,	40	.	6	.
	3d,	27	.	7	.
	15th,	23	.	6	in the evening.
	16th,	3	.	7	.
	17th,	43	.	7	.
	18th,	23	.	8	.
	19th,	5	.	9	.
	20th,	48	.	9	.
	21st,	35	.	10	.

The planets Mercury and Georgium Sidus will be in conjunction on the 5th, at which time the latter planet will be 76' north of the former. The Georgium Sidus will also be in conjunction at 9 in the morning of the 8th; and Mars will be in opposition at $\frac{1}{2}$ past 9 in the evening of the same day. Venus and the star marked β in Scorpio will be in conjunction on the 14th, when the star will be 6' south of the planet. Jupiter will also be in conjunction at 4 in the morning of that day; and the Moon and Mars will be in conjunction at 37 m. after 1 in the morning of the 22d.

The eclipses of Jupiter's satellites are not visible this month, on account of the planet being too near the Sun.

ON THE CALCULATION OF ECLIPSES.

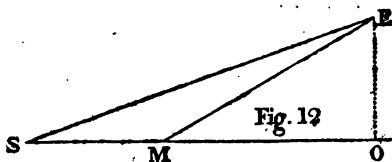
[Concluded from p. 331.]

Method of Calculating the Circumstances of Solar Eclipses.

THE first thing which presents itself in our inquiries relative to eclipses of the Sun is, whether there will be an eclipse on any part of the Earth's surface; then, what will be its extent and duration, with the epochs of its beginning, middle, and end. By considering eclipses of the Sun as eclipses of the Earth, to an observer situated in the Moon, these circumstances will be easily determined. In that case it is required to ascertain the apparent distance of the

centre of the terrestrial disc from the centre of the lunar shadow for any given instant; and, from the known diameters of the Earth and the shadow, to calculate the times at which they will appear to penetrate each other. This research is, therefore, altogether similar to that we have employed in calculating eclipses of the Moon as seen from the Earth; and the same method will conduct us to similar results; the only difference is in considering the centre of the Moon as the centre of the visual rays.

Let E (fig. 12), therefore, be the centre of the Earth, M that of the Moon, and S of the Sun, at any instant; and consider the triangle ESM as formed by lines joining these three points. If the side SM be produced, it will be the axis of the lunar shadow; and the angle OME , formed by this prolongation and the visual ray EM , drawn from the Moon to the Earth, will evidently be the apparent distance of the centres of the Earth and shadow; which it is required to determine.



Now, in the triangle SME , there are known the two sides SE and ME , which are the respective distances of the Earth from the Sun and Moon, and the angle at E , which is the apparent distance of these two heavenly bodies as seen from the Earth; and which is expressed by the difference of their latitudes and longitudes, in the same manner as for eclipses of the Moon in the preceding article. We shall, therefore, have for any epoch whatever an expression for the distance of the centre of the shadow from that of the terrestrial disc, as seen from the

Moon ; and by putting this expression equal to the different values which correspond to the different phases of the eclipse, and taking the time for the unknown quantity, we may determine the precise epochs of their occurrence.

In the preceding reasoning no regard has been paid to the diurnal revolution of the heavens, or, more properly, the diurnal rotation of the Earth upon its axis. When we consider the Earth in general, this revolution has only the effect already noticed in eclipses of the Moon ; but when any determinate physical point on its surface becomes one of the data under consideration, this rotation may not only have an effect upon the possibility of the eclipse being visible, by bringing the observer into the enlightened hemisphere, or removing him from it, but also by altering his distance from the centre of the Moon, and changing her parallax, it may cause a solar eclipse to be visible, which would otherwise not be seen, or occasion one to be seen that would otherwise be invisible.

But the difficulties which the consideration of a given point on the surface introduces into the problem, are easily overcome by reasoning relatively to it in the same manner as for the centre ; only employing the given quantities suitable to the new circumstances ; that is, the apparent elements of the two bodies, as seen from the assigned point, instead of the true elements answering to the centre of the Earth. And as the two kinds of quantities differ only in the value of the parallaxes of longitude, of latitude, of declination, and right ascension, when the method of calculating the time of the different phases of an eclipse for the centre of the Earth is known, the corrections necessary for bringing it to the surface will be readily found.

If we examine, in a general manner, the motion of the lunar shadow across the terrestrial disc, we shall perceive that its progress, relative to us, ought

to be from west to east, in the proper direction of the Moon's motion: since the angular motion of this body about the Earth is much greater than that which apparently belongs to the Sun, its shadow ought to follow the same direction. Thus, an observer in the Moon, regarding the Earth as eclipsed, would see the eclipse commence on the western part of the disc, and end on the eastern. This is the only part of the phenomena that is constant; for the extent of the part eclipsed, and its position on the solar disc, are subject to great variation.

In the preceding figure, let the angles ESO and EMO be denoted by S and M respectively. The exterior angle EMO of the triangle ESM is evidently the apparent distance of the centre of the Earth from the axis of the lunar shadow; which denote by d , as in the former case for eclipses of the Moon. Then we shall have $d = E + S$, and consequently $S = d - E$.

From the point E, draw EO perpendicular to MO, the axis of the lunar shadow; then, from the triangle ESO, we have $EO = ES \cdot \sin S$, or $D' \cdot \sin S$; where D' is the distance of the Sun from the Earth. But in the triangle EMO, we have $EO = EM \cdot \sin d$, or $D \cdot \sin d$, where $D = EM$, the distance of the Moon from the Earth. And by putting these two values of EO equal to each other, we obtain,

$$D' \cdot \sin S = D \sin d, \text{ or } D' \cdot \sin (d - E) = D \cdot \sin C.$$

For the ratio of the distances, or $\frac{D'}{D}$, there may be substituted the inverse ratio of the parallaxes of the two bodies, or $\frac{\sin p}{\sin p'}$, where p' is the parallax of the Sun, and p that of the Moon, and we then have

$$\sin p \cdot \sin (d - E) = \sin p' \cdot \sin d.$$

This equation is both general and accurate; and when employed at the time of an eclipse, the angle SEM is always, very small as it is, the apparent distance of the centres of the Sun and Moon, when their discs are at least partly interposed before each other; this distance may therefore be considered as the hypotenuse of a right angled triangle, as has been done in treating of eclipses of the Moon. In this case, then, the sides will be the difference of latitude and longitude of the two heavenly bodies at the time of the eclipse; therefore, let the horary motion of the Moon, in latitude and longitude, be denoted by n and m ; and that of the Sun in longitude by m' ; the latitude of the Moon at the moment of her conjunction by l ; and t , the time from the conjunction, expressed in hours and fractions as before; then the difference of latitude at the time t will be equal to $l + nt$, and of longitude $(m - m')t$; and we shall have

$$E^2 = (m - m')^2 t^2 + (l + nt)^2.$$

The value of E , found in the first of these equations, substituted in the second, will enable us to find the value of t in terms of d ; and, therefore, if there be given to d its different values corresponding to the different phases of the eclipse, the time t will be the only unknown quantity in the equation, and which may therefore be found by its solution.

The first of these equations would give the value of E in an accurate and elegant manner; but the solution may be simplified by making use of an approximation, that will not introduce an error into the result greater than $\frac{1}{100}$ ths of a second of a degree. Accordingly, in finding the value of E , the small arcs, p , p' , d , and $d - E$, may be considered as proportional to their sines, and then the equation becomes

$$p(d - E) = p'd, \text{ and therefore } E = \frac{p - p'}{p}d;$$

and this value substituted for E in the second equation gives

$$(m - m')^2 t^2 + (l + nt)^2 = \left(\frac{p - p'}{p}\right)^2 d^2,$$

a formula similar to that which was found for eclipses of the Moon; except that d^2 is multiplied by $\left(\frac{p - p'}{p}\right)^2$ in this, and not in the other. But, as the same factor is also found in an inverted order in the values that are to be substituted for d , the results will be absolutely the same for both. This equation is therefore to be resolved by adopting the same auxiliary angle, and eliminating $m - m'$ in exactly the same manner as has been done in the preceding article, and we shall obtain

$$t = \frac{1}{n} (\pm \sin a \sqrt{\left(\frac{p - p'}{p}\right)^2 d^2 - l^2 \cos^2 a} - l \sin^2 a).$$

All that is now required to be done in order to find the epoch answering to any particular phase of an eclipse is to substitute, in this expression, the value of d answering to that phase; and this substitution will give the corresponding value of t , or the time of its occurrence.

For example, if the beginning and end of the eclipse were required, or the moment when the edge of the Earth's disc entered and quitted the lunar penumbra, it would only be necessary to substitute for d its value at that time, viz.

$$d = \frac{D + D'}{2} \left(\frac{p}{p - p'}\right) + \tilde{p};$$

in which the letters denote the same quantities as before; and the quantity under the radical corresponding to these two instants would become

$$\sqrt{\left(\frac{D + D'}{2} + p - p'\right)^2 - l^2 \cos^2 a},$$

the other quantities remaining as in the preceding equation. The same conclusions may also be derived in this case relative to the middle of the eclipse, the extent of the part eclipsed, and the duration of the eclipse, as in the preceding article. If the observer were supposed to be situated at the centre of the Earth, $p=0$, and $p'=0$ also, and therefore the part under the radical would then be simply

$$\sqrt{\left(\frac{D+D'}{2}\right)^2 - b^2 \cos^2 a}.$$

We shall subjoin an example for the use of such of our readers as may wish to try the calculation; and as it is designed only as an example of the calculation, we shall select the eclipse of the Sun, which happened on the 1st of April, 1764, and was adopted by *Dionis-du-Sejour*, as the basis of his great work on eclipses, taking the elements as they stand in that work; the only difference between this example and others being that of finding the elements by means of astronomical tables for the proper time.

Time of the conjunction in solar time at Paris	=	h. m. s.
Latitude of the Moon in conjunction	$l =$	+ 39° 32' N.
Moon's horary motion in latitude approaching the N. pole of the ecliptic	}	$n =$ + 2 44
Moon's horary motion in longitude		
Sun's horary motion in longitude	$m =$	+ 29 39
Sun's horizontal parallax	$p' =$	8.8
Moon's horizontal parallax in conjunction	$p =$	54 1.5
Moon's apparent diameter	$D' =$	29 29
Sun's apparent diameter	$D =$	31 52

By substituting these quantities in the formula, we find

$$a = 5^\circ 44' 27''.$$

At the commencement of the eclipse	$t =$	h. m. s.
At the middle	$t =$	— 2 53 1
And, at the end	$t =$	— 0 8 1
		2 35 59

The beginning and middle of the eclipse, therefore, happened before the conjunction, and the end after it. The least apparent distance of the centre of the Earth and the lunar shadow, which was equal to

$\frac{p}{p-p} . l \cos a = 39' 27''$. This distance being less

than the parallax of the Moon, which is equal to the apparent semidiameter of the Earth seen from the Moon, the shadow, at that time, fell wholly upon the terrestrial disc, and, consequently, the eclipse was *central* in some places. Since the apparent diameter of the Sun exceeded that of the Moon, the eclipse was therefore *central* and *annular* in certain places; and, in others, it was annular without being central. There also remained more than half the terrestrial disc where it would not be seen at all; for the radius of the penumbra $= 30' 45''$, which is less than the least distance of the centres $39' 27''$; so that on the radius over which the shadow passed there remained a part $= 8' 42''$ not eclipsed. Subtracting this from the apparent semidiameter of the Earth, equal to $54' 1''.5$, there remained $45' 19''.5$ for the part eclipsed; and which is easily found to be 5.03 digits.

With respect to the slight modifications necessary to be introduced into the results obtained by the formula we have given, when the greatest accuracy is required, both on account of the variations in all the elements of the Moon experienced during the eclipse, the figure of the Earth, the effect of its atmosphere, and the consideration of a given physical point on the Earth's surface, the nature of this work obliges us to refer the reader to some comprehensive treatise on astronomy. He will find them treated in detail in the *Traité élémentaire d'Astronomie Physique*, par M. Biot; whose method we have chiefly followed in our present disquisitions on this subject.

The Naturalist's Diary.

Hail, eldest of the monthly train,
Sire of the winter drear,
DECEMBER, in whose iron reign
Expires the chequered year.

As Winter unfolds his awful train, 'vapours, and clouds, and storms,' the contemplative observer of nature becomes habituated to views of the stupendous and sublime. Verdant groves, variegated meadows, and radiant skies, - are now succeeded by leafless woods, dejected wastes, and a frowning atmosphere. But while the incurious and inattentive perceive a dreary uniformity in all around, the penetrating eye of the rural student discovers many a varied aspect of beauty and excellency, which still invite to the most pleasing investigation. And, however paradoxical it may appear, he finds inexhaustible sources of serenity and delight, in that mood of melancholy musing on scenes of desolation, which, in vulgar estimation, would rather

Deepen the murmur of the falling floods,
And breathe a browner horror o'er the woods. POPE.

In fine, in each vicissitude of the seasons, he still discerns the omnipotent Creator, ever bountiful to man; and, whether the gentle gales breathe propitious in spring, or resistless storms ravage the earth in winter, his cultivated mind kindles with devotion, and even calls upon the inanimate world to join him in adoration:

To HIM, ye vocal gales,
Breathe soft, whose spirit in your freshness breathes:
Oh, talk of HIM in solitary glooms!
Where, o'er the rock, the scarcely waving pine
Fills the brown shade with a religious awe.
And ye, whose bolder note is heard afar,
Who shake th' astonished world, lift high to Heav'n
Th' impetuous song, and say from whom you rage.

THOMSON.

Rain and wind are extremely prevalent in this month, and, as the frost seldom sets in till the latter end of December, this month may be reckoned the most unpleasant of the whole year. The weather is cold, bleak, and gloomy; and, generally, one continual succession of storms and tempests. At other times, we have ice and snow; and, about Christmas, the cold is sometimes intense.

At WINTER'S numbing touch, the fields
Lie withered to a waste,
The *trees* their naked boughs extend,
Obnoxious to the blast.

The lifeless *leaves* blow here and there,
The sport of ev'ry wind;
And here and there the *wood-birds* flit,
But can no shelter find.

In the *unfinished furrow* lies
The *plough*, nor wounds the field;
The *restless rivers* cease to run;
In icy durance held.

Shorn of his rays, scarce does the *sun*
His glaring orb reveal;
But sudden *sets* :—Night fast behind
Unfolds her sable veil.

GRÆME.

The flowers mentioned as continuing in blow in January, of course afford their beauties in this month. Evergreens, firs, ivy, laurel, and that most beautiful plant the *arbutus*, rich in flowers and fruit at the same time, serve to enliven this dreary month. The common *arbutus* (*arbütus unedo*), or strawberry-tree, rises to the height of twenty or thirty feet, but rarely with an upright stem: it usually puts out branches very near the ground. The leaves keep on all the winter, and are thrust off in the spring by new ones; so that it is always clothed with leaves.

The oak, the beech, and the hornbeam, in part, retain their leaves, and the ash its keys. The common holly (*ilex aquifolium*), with its scarlet berries, is now conspicuous; and those dwarfs of the vege-

table creation, *mosses*, and the liverwort (*lichen*), now attract our notice.

Now nought is green upon the oak
But moss and rarest *mistletoe*.

Mosses are spread over the whole globe, so that, in some situations, the soil is exclusively covered by them; and thus, frequently, bare rocks gradually become fertile. As they grow most copiously on the north-west side of trees, it is probable that mosses serve to protect them from the severity of cold; but if these parasitical plants be suffered to increase too abundantly, they not only tend materially to injure trees, but also to stifle the more useful vegetables of the soil. Mosses are almost constantly green, and have the finest verdure in autumn. Some of the mosses spread in a continued leaf; others grow hollow above, like small cups; others round on the top, like mushrooms; and some shoot out in branches. All these have their different seeds, which do not require great delicacy of soil, but take root on any thing where they can grow unmolested.

Those *mosses* which rise immediately from the earth are more perfect; some of them white and hollow, or fistulous; and some of them not much inferior to regular plants. The more perfect sorts grow on stones, in the form of a fine pile or fur, like velvet, and of a glossy colour, between green and black. But the first sort, which appears like scurf or crust, seems to rise but one degree above the unwrought mould or earth. An unhealthy tree is never without these imperfect *super-plants*; and the more unhealthy the tree is, the better they thrive. A few of the most remarkable mosses, are, the greater water-moss (*fontinalis antipyretica*); *bryum rurale*; grey bog-moss (*sphagnum palustre*); yellow powderwort (*byssus candelaris*, or *lichen flavus* of Withering); and the common club-moss (*lycopodium clavatum*). This last grows in dry mountainous places,

heaths, and woods, and is principally found in the north of England; it produces a prostrate creeping stem from one to three yards in length, and flowers from July to August. Mosses, diminutive as they seem, are no less perfect plants than those of greater magnitude, having roots, flowers, and seeds.

Each moss,
Each shell, each crawling insect, holds a rank
Important in the plan of HIM who formed
This scale of beings; holds a rank, which lost
Would break the chain, and leave a gap
That Nature's self would rue!

Of the liverworts, or lichens, there are more than three hundred and sixty species, the greater number of which are natives of Britain. The various kinds of lichens are subservient to many important purposes; some are used as dying-drugs: in Lapland, one species constitutes the sole winter subsistence of that useful animal the rein-deer; and, in Britain, the *lichen islandicus*, which grows much on the mountains of Wales and Scotland, is used as a medicine. In Iceland, food is prepared from it.

The *red-breast* is still heard 'to chaunt his cheerful strain,' and again demands our tribute of affection, which we cheerfully render to him in the following stanzas of an anonymous poet:—

The summer's past—the *swallow's* fled,
The *linnet* seeks her half-leaved shed,
And mourns the sun's decline;
But thou, my ROBIN! constant bird,
With sweetly plaintive voice art heard,
Though storms uproot the pine.

DECEMBER's blasts no fears create,
With Hope's soft strain thou cheer'st thy mate,
Although no sunbeams shine;
For in this season doubly rude,
The humble song of gratitude,
Sweet ROBIN, still is thine.

As so few of the feathered tribe are seen in this dreary month, we must not forget to assign a place,

in our ornithological register, to the harmless, chirping, *sparrow*. No bird more frequently meets our eye than this, and if it does not charm the ear by its voice, it amuses the mind by its familiarity and craftiness. It frequents our habitations, and is seldom absent from our gardens and fields. Though its note is only a *chirp*, in a wild state; when early reclaimed, it may be taught to imitate the strain of the linnnet or goldfinch. Few birds are more execrated by the farmers, and none, perhaps, more unjustly. It is true, indeed, they consume a considerable quantity of grain and fruit, but then it should be considered that a pair of them will destroy upwards of *three thousand* caterpillars in a week. Nor is the utility of these birds limited to this circumstance alone: they likewise feed their young with butterflies and other insects, which, if suffered to live, would be the parents of numerous caterpillars. Catullus has devoted an Elegy to the Sparrow, replete with poetic beauty. This fortunate bird was

D'une belle Romaine ami tendre, hôte heureux,
Aimable parasite, et compagnon fidèle,
Sautillait, babillait, tourbillonnait près d'elle,
Sur ses lèvres de rose accourait à sa voix,
Baisait son cou d'albâtre ou becquetait ses doigts;
Et, des jeunes Romains voluptueux émule,
Fut pleuré par Lesbie, et chanté par Catulle. DE LILLE.

The shortest day, or winter solstice, happens on the 21st of December; and the joyful season of Christmas is now fast approaching.

How many a heart is happy at this hour
In ENGLAND! brightly o'er the cheerful hall,
Flares the heaped hearth, and *friends* and *kindred* meet,
And the glad *mother* round her festive board
Beholds her *children*, separated long
Amid the world's wide way, assembled now;
And at the sight, *affection* lightens up
With smiles the eye that AGE has long bedimmed.

I do remember when I was a child,
 How my young heart, a stranger then to care,
 With transport leaped upon this holy day,
 As o'er the house all *gay with evergreens*,
 From friend to friend with eager speed I ran,
 Bidding a *merry Christmas* to them all ¹.

Towards the end of the month, *woodcock* shooting commences. The predictive signs of his appearance are faithfully marked by the author of '*Fowling*,' a poem; and the haunts and habits of this bird are prettily described by the same author ².

Pope, in his '*Windsor Forest*,' has the following picturesque description of the winter sports of the fowler:—

With slaught'ring gun th' unwearied *fowler* roves,
 When frosts have whitened all the naked groves;
 Where *doves* in flocks the leafless trees o'ershade,
 And lonely *woodcocks* haunt the wat'ry glade.
 He lifts his tube, and levels with his eye;
 Straight a short thunder breaks the frozen sky;
 Oft, as in airy rings they skim the heath,
 The clam'rous *lapwings* feel the leaden death:
 Oft, as the mounting *larks* their notes prepare,
 They fall, and leave their little lives in air.

Of the snipe (*scolopax gallinago*), which becomes a prey to the fowler in this and the following month, there are more than forty varieties, mostly breeding in Europe, and subsisting on insects. Some of these wild-fowl frequent moors, others delight in swampy bushes, and others in the open fields ³.

¹ From Lines written in Spain, on Christmas Day, by R. Southey, Esq. See his interesting '*Letters from Spain*,' vol. i, p. 109.

² See FOWLING, a *Poem*, pp. 101, 102, 109, 110. This poem is descriptive of Grouse, Partridge, Pheasant, Woodcock, Duck, and Snipe shooting, and forms a pleasing companion to the '*Chace*' of Somerville.

³ See our last volume, p. 351.

With pleasure now the fisher-boy will take
His quantum of the ugly dark-hued *hake* ;
Nor less delight his anxious bosom feels,
To view the lead-complexioned conger *eels*,
In span so bulky, in dimension long,
To touch quite slimy, and in motion strong.
These mostly constitute the troller's gain¹,
Who, blest with them, ne'er thinks he toils in vain ;
Willing endures winds, wet, frost, hail, and snow,
With all the perils of the depths below.

These fish constitute the major part of the winter's produce, though the fishermen are sometimes fortunate enough to procure soles, turbot, flat-fish, &c. &c. in the trolling-nets. The *conger-eel* is, upon the western coast, the most disgusting marine production that can meet the eye. The largest are nearly two yards in length, and proportionate in thickness ; which the poor people are obliged to eat, for want of other victuals. Soup, it is said, made from this eel is very nutritive, and delicious to the palate. A conger eel was, some time since, taken in the Wash at Yarmouth, by a fisherman, which measured six feet in length, and twenty-two inches in girth, and weighed three stone seven pounds. The eel, on finding no way for escape, rose erect, and actually knocked the fisherman down before he could secure it.

In this month, those wild animals which pass the winter in a state of torpidity, retire to their hiding places. The frog, lizard, badger, and hedgehog, which burrow under the earth, belong to this class ; as also the bat, which is found in caverns, barns, &c.

¹ The *Trolling Net* is by no means so large as the Seine, being affixed to what is called the troll-bar ; this is a long piece of wood, each end of which is rivetted into a broad thick piece of solid metal, called the troll-irons, the weight of which sinks the net to the bottom ; where, after remaining some time, the toil is closed by means of ropes communicating from the troll-net to the troll-boat, when it is hauled up, and the produce taken out.

suspended by the claws of its hind feet, and closely enveloped in the membranes of the fore feet. Dormice, squirrels, water-rats, and field-mice, provide a large stock of food for the winter season.

On every sunny day through the winter, clouds of insects, usually called gnats (*tipulæ* & *empedes*), appear sporting and dancing over the tops of ever-green trees in shrubberies; and they are seen playing up and down in the air, even when the ground is covered with snow. At night, and in frosty weather, or when it rains and blows, they appear to take shelter in the trees.

Little work is done by the farmer, out of doors, in this month; his cattle demand almost all his attention and assiduity.

We shall now take leave of our readers with some pleasing reflections on WINTER, and the SEASONS in general; from the pen of an admired and elegant essayist¹.

Severe and rigorous as WINTER usually is, its various scenes, however, cannot fail to suggest many subjects of gratitude to the contemplative philosopher. Few minds are so devoid of sensibility, as not to experience the most grateful emotions, when the inexhaustible bounties of the Supreme Being bloom around in *spring*, in beautiful profusion; delight the eye in *summer* with maturing promise; and ripen in *autumn* into rich and exquisite perfection.

In general, even in minds not unsusceptible in other respects, we seldom find a disposition to grateful admiration, when they behold the ravages in the creation; the orchards stripped of their golden fruits; and harmony extinct in the groves, when

¹ See the '*Contemplative Philosopher*,' 2 vols. 12mo, one of the most fascinating books ever published. We know of no work on the various objects of Nature, which may be perused with equal advantage by persons of either sex, and of every age.

No mark of vegetable life is seen,
No bird to bird repeats his tuneful call,
Save the dark leaves of some rude evergreen,
Save the lone red-breast on the moss-grown wall.

JOHN SCOTT.

But the benign Governor of the universe, who has subjected his creatures to the rigours of this season, has graciously enabled them to mitigate its severity by a variety of resources. The woods, which, in *spring*, crowned the hills with majestic verdure, now contribute to erect the comfortable mansion; or, added to what is extracted from the bowels of the earth, afford us the unspeakable blessing of fire. The flocks, which no longer gladden our plains, nor, to the poetic eye, revive Arcadian scenes, have given us their summer fleeces to protect us from the piercing cold; and the fruits with which *autumn* adorned our orchards, are now laid up, with its golden harvests, for our nourishment and support. In a word, the devout mind may have reason, even in winter, to exclaim with the Psalmist, *O Lord, how manifold are thy works! In wisdom hast thou made them all: the earth is full of thy riches.*

Had it been given to us mortals to comprehend the connexion of every thing in nature, with what fervour of admiration should we adore the wisdom and goodness of the great CREATOR! But although we are incapable of forming an idea of the plan and extent of his wondrous works (those works which display infinity in the two extremes of magnitude and minuteness), we may yet perceive enough to convince us, that, with respect to the happiness of the whole, every thing in nature must be ultimately ordered for the best.

The felicities of the golden age are beautiful in poetic vision. A youthful fancy is delighted with fruits and blossoms blushing, 'in social sweetness, on the self-same bough.' It wanders, with ecstasy, through groves adorned with perennial verdure, while

Favonian gales perfume the ever-smiling skies. But these are the enchanted perversities of fiction, not the sober representations of truth. The human mind, which seems ever anxious for new gratifications, would revolt at the idea of perpetual sameness and uniformity, even in the most beautiful scenes and the most exquisite enjoyments. One can have no idea of happiness, when it does not, in some degree, result from comparison: for not only variety contributes much to our sense of happiness, but not unfrequently a recollection of former calamities, or of some recent suffering. That degree of ease which we scarcely regard in the full enjoyment of health, is ecstacy itself, when pain has taught us how to prize the inestimable blessing. In the moral world, 'how sweet are the uses of adversity,' which best instruct us how to estimate and how to enjoy prosperity!

In like manner, the recollection of the frowning skies of *winter* will make us rejoice in the return of that *spring*, in whose flowery walks, if perpetual, we should have trod with languor and indifference. More cheerily will the heart then dance to the music of the groves, when it recollects how recently their tuneful haunts were dumb. Brighter, then, will be the verdant robes which the woods assume, contrasted with their late leafless and inhospitable appearance; and, as 'hope waits upon the flowery prime,' the fruits and flowers, when they bud, will delight the fancy, in sweet anticipation, with all the pride of *summer*, and all the riches of *autumn*. The rigours of departed winter will be forgotten in that all-enlivening renovation of Nature.

In fine, our hearts, then attuned to cheerfulness and gaiety, will confess this important truth, that, 'as Providence has made the human soul an active being, always impatient for novelty, and struggling for something yet unenjoyed with unwearied progression, the world seems to have been entirely adapted to

this disposition of the mind : it is formed to raise expectation by constant vicissitudes, and to obviate satiety by perpetual change.'

THESE, as they change, ALMIGHTY FATHER ! these
Are but the varied God. The rolling year
Is full of Thee. Forth in the pleasing SPRING
Thy beauty walks, thy tenderness and love.
Wide flush the fields ; the softening air is balm ;
Echo the mountains round ; the forest smiles ;
And every sense, and every heart, is joy.
Then comes Thy glory in the SUMMER months,
With light and heat refulgent. Then Thy sun
Shoots full perfection thro' the swelling year ;
And oft' Thy voice in dreadful thunder speaks ;
And oft' at dawn, deep noon, or falling eve,
By brooks and groves, in hollow-whispering gales,
Thy bounty shines in AUTUMN unconfined,
And spreads a common feast for all that lives.
In WINTER awful Thou ! with clouds and storms
Around Thee thrown ! tempest o'er tempest rolled,
Majestic darkness ! On the whirlwind's wing,
Riding sublime, Thou bidst the world ADORE !

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TO

TIME'S TELESCOPE,

FOR

1814, 1815, 1816, and 1817.

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